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ANNUAL REPORT
OF THE
GOVERNOR OF
THE PANAMA CANAL
FOR THE
FISCAL YEAR
ENDED JUNE 30
1921



386
P187

WASHINGTON
GOVERNMENT PRINTING OFFICE
1921

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APPENDIXES NOT PRINTED.

REPORTS OF HEADS OF DEPARTMENTS AND DIVISIONS.

Reports for the fiscal year 1921 have been made as follows, and may be consulted at the Washington office of The Panama Canal, or at the office of the Governor, Balboa Heights, Canal Zone:

Engineer of maintenance:

- Pacific locks, report of superintendent.
- Atlantic locks, report of superintendent.
- Electrical division, report of electrical engineer.
- Municipal division, report of resident engineer.
- Dredging division, report of superintendent.
- Office engineer.
- Meteorology and hydrography, report of chief hydrographer.
- Surveys, report of assistant engineer.
- Gatun dam, report of general foreman.

Marine division, report of superintendent.

Mechanical division, report of superintendent.

Supply department, report of chief quartermaster.

Executive department, report of executive secretary.

Accounting department, report of the auditor.

Health department, report of the chief health officer.

Purchasing department, report of the general purchasing officer and chief of Washington office.

APPENDICES NOT PRINTED

OF THE HOUSE OF REPRESENTATIVES AND SENATE

THE HOUSE OF REPRESENTATIVES AND SENATE have been made as follows and may be obtained from the Library of the House of Representatives and the Senate.

APPENDIX

APPENDIX A

APPENDIX B

APPENDIX C

APPENDIX D

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APPENDIX I

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APPENDIX K

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APPENDIX O

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APPENDIX Q

ANNUAL REPORT OF THE GOVERNOR OF THE PANAMA CANAL.

THE PANAMA CANAL,
OFFICE OF THE GOVERNOR,

Balboa Heights, Canal Zone, September 10, 1921.

The honorable the SECRETARY OF WAR,

Washington.

SIR: Herewith is the report of the Governor of The Panama Canal for the fiscal year ended June 30, 1921.

INTRODUCTION.

Heretofore the report has consisted of detailed reports by heads of departments and divisions, preceded by a summary made by the Governor. This year the detailed reports are placed on file (two copies of each at the Washington office of The Panama Canal, and two at Balboa Heights) where they will be available for public use, and only the summary by the Governor is submitted for printing. Anyone who wishes more elaborate information than is contained herein is requested to write to The Panama Canal, Washington, D. C., or Balboa Heights, Canal Zone.

In the new form of report, instead of considering the work by the departments and divisions that have done it, the organization units are disregarded and the division is made by classes of work. A summary of the work of the Panama Railroad Co. is also included in this report, which has not been done heretofore. The two organizations—canal and railroad—are so interdependent that a complete summary must include both.

Broadly speaking, the Governor, who is also president of the Panama Railroad Co., is charged with carrying on the following work:

1. *Canal operation.*—All work that involves putting ships through the canal, and maintenance of the waterway.

2. *Business enterprises.*—Work of providing fuel, provisions, chandlery, and repairs to vessels; food and clothing to the working force; handling of cargo, and like business operations; and operation of the steamship line and the Panama Railroad; in fact, all work that in the United States is commonly carried on by private enterprise.

3. *Government.*—Functions that correspond in measure to many of those of National, State, and municipal Governments in the United States, such as diplomatic relations, posts, customs; police functions in the broad sense of the word; education, health, water supply, and like public services commonly assumed by municipalities.

The administration of this work is discussed in Section IV, and Section V contains financial and statistical statements.

MONEY TURNOVER IN 1921.

In terms of money, The Panama Canal had gross revenues of more than twenty-seven million dollars; increased investment in capital additions, stock, etc., of eight millions; gross operating expenses of twenty-four and one-half millions. The excess of revenues over operating expenses was two and three-fourths million dollars. No interest on capital cost of the canal is included in this.

The Panama Railroad Company in its operations on the Isthmus had a gross revenue of approximately twenty-two millions; increase in investments in capital additions, stock, etc., of one and one-half millions; gross operating expenses of twenty-two millions.

The Panama Railroad Steamship Line had gross revenues of \$5,156,446.84; increase in capital investments, \$417,005.67; operating expenses, \$5,857,257.06.

The money turnover of the joint business of the Panama Railroad Company's operations on the Isthmus and the Panama Railroad Steamship Line was, therefore, approximately \$27,100,000 gross revenue; \$2,000,000 increase in capital investments; and \$27,800,000 in operating expenses.

The money turnover of the joint business of The Panama Canal and all operations of the Panama Railroad Company, including its steamship line, was, therefore, approximately \$54,000,000 gross revenue; \$10,000,000 increase in capital investments; and \$52,000,000 in operating expenses.

IN TERMS OF SERVICE.

In terms of service, the following are the main items of work accomplished:

Transits of the canal by ships paying tolls.....	number..	2, 892
Transits by United States Government ships, free.....	do.....	426
Calls at canal ports by ships not transiting canal.....	do.....	842
Cargo handled at ports.....	tons..	1, 109, 726
Coal delivered.....	do.....	468, 815
Coal, number of ships served other than Panama Canal.....		1, 345
Fuel oil pumped.....	barrels..	4, 565, 784
Fuel oil, number of ships served other than Panama Canal.....		1, 175
Ships repaired, other than Panama Canal equipment.....	number..	671
Ships dry-docked, other than Panama Canal equipment.....	do.....	104
Provisions sold to ships.....	value..	\$949, 380. 29
Chandlery sold to ships.....	do.....	\$290, 466. 32

SECTION I.

CANAL OPERATION AND TRADE VIA PANAMA.

The policy of expediting the passage of ships through the canal was continued under the plan that if a vessel arrives at either entrance at an hour which will permit her dispatch through the last lock before dark, there is no obstacle to a continuous passage. If she needs fuel, supplies, or repairs, these are furnished with least possible loss of time. The system operates on the principle of causing as little delay as practicable to ships. It is believed this policy should be continued, if not indefinitely at least until the present uncertainty in shipping business is ended and until the Panama route has so solidly established itself in trade that a slight let down will not be likely to throw trade from this to a competitive route.

Almost one-third of the total tonnage handled in 1921 was so strongly competitive that prompt and complete service may have been the determining factor in the choice of the Panama route. The fact that much of the trade is competitive seems to be so little understood that the experience of the year just closed is worth recounting in this respect. Figures referred to in the following will be found in the section on traffic by "Leading trade routes."

THE CANAL IN COMPETITION WITH OTHER WATER ROUTES.

In many of the trades served by The Panama Canal, the saving of distance, and hence of time, by the use of the canal is so great that shipping could hardly afford to use any other route, assuming that even reasonable efficiency and fair charges prevail at the canal. Such trades, conspicuously, are the coast-to-coast trade of the United States; the traffic between the west coast of North and Central America and the Atlantic coast of North and South America, Europe and Africa as far as 20 degrees south latitude; and the trade of the Atlantic coast of North America and Europe with the west coast of South America, excepting the lower part of the coast of Chile.

There are other trades, however, in which routing through The Panama Canal may or may not be an advantage. Such, naturally, are those in which the saving of distance as between this and an alternative route is not great, while other conditions, such as trade connections along the route, fueling costs, currents, and weather conditions, national interests, etc., may form the deciding factors when the

operator chooses his routing. The two great trades in which The Panama Canal is in distinct competition with other water routes are those between Europe and Australia and New Zealand, and between the Atlantic coast of the United States and the Far East, principally that area lying between Singapore and Japan.

A ship from the United Kingdom with cargo for both Australia and New Zealand might go through Suez, or around the Cape of Good Hope, or through The Panama Canal without gaining a very great advantage in distance and time through the choice; and for the homeward journey would have, in addition, a choice of the course through the Strait of Magellan and up the Atlantic coast of South America.

If the vessel went out through one canal and returned through the other it would serve the area with the least possible travel; but at that it would save only about 1,400 miles over a course going out by way of the Cape of Good Hope and returning through the Strait of Magellan. By not using either canal it would avoid paying approximately \$1.25 per net ton in tolls on each leg of the voyage. (Tolls for cargo vessels at Suez are substantially the same as at Panama.) The greater distance of 1,400 miles by the cape and strait route would mean about five additional days at sea for a 12-knot vessel. Such saving of itself alone would not compensate for the canal tolls. The deciding factors would be fueling costs and the possibilities of additional traffic to be handled along the way.

Normally the Panama route has an advantage in coal costs. Until March of 1921 the prices at Panama were appreciably lower than at competing coaling stations. Since then the comparison has been:

Year.	Panama.	Buenos Aires.	Gibraltar.	Port Said.	Cape-town.
Apr. 1, 1921.....	¹ \$12.00	² \$18.00	² \$10.80	² \$15.12	² \$11.02
July 1, 1921.....	¹ 14.00	² 18.00	² 13.68	² 15.12	² 10.03

¹ Trimmed in bunkers.

² Alongside.

All quotations except Panama on basis of 18 cents to a shilling.

Norfolk, at which vessels may call en route between Europe and Panama, is one of the cheapest coaling ports in the world.

The distance between bunkering stations is, of course, a further factor. Coal costs along the east coast of South America are heavy, but there is additional trade to be had there, especially in passenger traffic; in the future, the development of oil fields of Patagonia may insure cheap fuel in that area. The increasing use of oil fuel in steamships and of motorships will reduce the inequalities in bunkering costs over the world, besides making it possible for many ships to bunker at a cheap station for the round voyage. Lloyd's Register for 1921 shows only 20.6 per cent of ocean-going vessels using oil fuel, but of

4,160 transits of the canal or calls by ships at Panama Canal ports in 1921, oil was supplied in 1,175 instances. This indicates a larger proportion of oil-burning ships to the total in the canal trade than is shown by Lloyd's for the total of world shipping.

In the trade between the Atlantic coast of the United States and the Far East the competition is practically restricted to the choice between Suez and Panama. Manila is equidistant from New York by either route, and Hongkong is practically so. The Chinese, Japanese, and Siberian ports are nearer by Panama; to the remainder of the Far East, exclusive of the Philippines, New Guinea, and other islands west of Celebes, the Suez route is varyingly shorter.

Steamers loading in the United States with full cargoes for the Far East normally proceed to their destination by the shorter route. The return voyage is governed by cargo offerings. A steamer out from New York via The Panama Canal for Yokohama might have to continue to Singapore or Batavia for a cargo which is offered for Europe or the United States; and in such case the return would be by way of Suez. This appears to be the actual drift of the trade, as shown by the statistics of 1920 and 1921. Twice as many vessels go out from the United States to the Far East by The Panama Canal as return by this route.

Before the World War it was customary to figure roughly that the cost of operating a steamer over the average route was equivalent to 10 cents per net ton a day, including capitalization, insurance, etc. On the same basis, it would probably be equally accurate to use 20 cents per net ton as the average daily operating cost at present. With this assumption, the canal tolls of \$1.25 per net ton, United States equivalent measurement, on laden vessels, would equal the cost of six and one-fourth days at sea. In other words, with other factors equal, a ship would have to save about six days and six hours on a voyage to offset the canal tolls. For a ship in ballast, with tolls at 75 cents a net ton, three and three-fourths days' saving would pay for the tolls. This is a rough-hewn calculation at best, and only indicative, as the actual cost of operation varies with each ship and routing.

Prompt and cheap handling of ships at the canal, in transiting, fueling, provisioning, etc., is an attraction to traffic from alternative routes. Such service would seem to be warranted purely as a means of increasing the revenue of the canal; while, on the other hand, delays and losses to shipping as the result of less than efficient handling are inescapably a burden on commerce and consumption, which should not be imposed.

THE CANAL AND THE RAILROADS.

A different type of competition, not with alternative water routes but with transportation overland, results from the use of the canal by vessels plying between the Atlantic and Pacific coasts of North America, primarily of the United States, and thus competing with the transcontinental railroads.

Vessels in this trade use the canal inevitably, and could pay higher charges for its use and still continue in the trade. The competition is between them and the railroads, on a basis of rates and promptness of dispatch, with the canal, administratively, simply an interested bystander. At present every increase in coastwise shipping through the canal increases its revenues. If legislation now being considered is made law and coastwise vessels are passed through without payment of tolls, the canal's revenues will drop. In either case the use of the canal in facilitating transportation between the two seaboards and reducing its cost will be an important economic factor in the industrial and commercial life of the nation.

Observation of rates published in 1921 has indicated that as between seaports on the two coasts the vessels can handle goods at about half the cost of rail transportation, and generally in less time. On either seaboard there is an area extending inward, over which the rail and water costs approach equality. In actual practice the situation is complicated by the arbitrary establishment of rail rates intended to counteract the competition of water transportation.

The situation is referred to as "competition," which it is in its present state. In time, however, there will probably be a status of cooperation, in which vessels and railroads will work together in the most economical transportation of goods, the service of the one supplementing that of the other. Such an arrangement is foreshadowed in the joint handling of cargoes by the coastwise lines and a few river steamship lines now in effect.

UNITED STATES GOVERNMENT VESSELS FREE.

Vessels of the United States Government, engaged on purely Government business, do not pay tolls. In the tonnage figures here shown, Panama Canal net tonnage is given on colliers, tankers, transports, cargo, and supply ships, etc., and displacement tonnage on battleships, cruisers, destroyers, mine layers, etc., on which measurement is in displacement rather than net tonnage. There has been no duplication in tonnage figures. In computing the amount of tolls these vessels would have paid if commercial rates had been assessed, the following method was used:

Panama Canal net tonnage, laden, \$1.20 per ton, providing this did not exceed the amount obtained by multiplying the United States equivalent tonnage by \$1.25.

Panama Canal net tonnage, ballast, 72 cents, providing this did not fall below the amount obtained by multiplying the United States equivalent tonnage by \$0.75.

Displacement tonnage, 50 cents per ton.

A summary of this traffic for the fiscal year 1921 is as follows:

Item.	Atlantic to Pacific.	Pacific to Atlantic.	Total.
Number of vessels.....	274	152	426
Panama Canal net tonnage.....	329,381	138,122	467,503
Displacement tonnage.....	464,904	433,759	898,663
Cargo carried, tons.....	443,033	10,736	453,769
Tolls collectible at commercial rates.....	\$588,886.49	\$336,014.80	\$924,901.29

RAPID GROWTH OF COMMERCIAL TRAFFIC.

The term "commercial traffic" includes all vessels subject to tolls, and the only ships not subject to tolls are public vessels of the United States and Panaman Governments.

During the fiscal year 1921 a total of 2,892 commercial vessels made the transit of the canal. Their aggregate net tonnage, measured according to Panama Canal rules, was 11,415,876, and they carried 11,599,214 tons of cargo. As compared with the fiscal year 1920 this was an increase of 16.7 per cent in the number of ships, an increase of 33.5 per cent in net tonnage, and an increase of 23.7 per cent in cargo. As compared with the fiscal year 1919 the increase in the number of ships was 42.6 per cent, in net tonnage 85.7 per cent, and in cargo 67 per cent. A statement of the traffic, 1915-1921, follows:

Fiscal year.	Ships.	Panama Canal net tonnage.	Tons of cargo.	Fiscal year.	Ships.	Panama Canal net tonnage.	Tons of cargo.
1915 ¹	1,072	3,772,167	4,926,145	1919.....	2,028	6,145,094	6,946,540
1916 ²	760	2,385,284	3,063,371	1920.....	2,478	8,546,044	9,374,499
1917.....	1,806	5,817,607	7,083,045	1921.....	2,892	11,415,876	11,599,214
1918.....	2,068	6,584,073	7,533,031				

¹ The canal was opened to commercial traffic Aug. 15, 1914.

² The canal was closed to traffic from Sept. 18, 1915, to Apr. 15, 1916.

TRAFFIC FLUCTUATIONS IN 1921.

Traffic increased consistently during the first nine months of the fiscal year 1921. New monthly records either for the number of ships, net tonnage, or cargo were established in August, 1920, September, 1920, January, 1921, and March, 1921. In April the canal began to experience the effects of the general slump in shipping. In May this was still more marked, and June, the final month of the

year, showed the least business of any. The monthly statistics follow:

Month.	Number of ships.	United States equivalent.	Panama Canal net tonnage.	Tolls.	Tons of cargo.
1920.					
July.....	225	705,643	856,798	\$842,312.05	886,814
August.....	266	782,415	951,345	936,209.44	1,040,740
September.....	256	832,742	1,008,785	1,010,150.63	1,009,557
October.....	238	762,013	935,579	911,825.58	991,066
November.....	238	765,817	929,875	933,912.11	984,910
December.....	265	832,407	1,027,918	1,007,849.32	1,076,539
1921.					
January.....	279	894,689	1,094,323	1,095,857.46	1,177,053
February.....	241	763,925	916,838	917,412.49	952,904
March.....	255	924,309	1,112,818	1,105,536.55	1,084,563
April.....	227	771,116	955,503	927,977.09	907,613
May.....	210	694,896	864,617	835,882.77	792,735
June.....	192	613,894	761,477	751,964.12	694,720
Total.....	2,892	9,343,866	11,415,876	11,276,889.61	11,599,214

SHIPS OF VARIOUS NATIONS IN CANAL TRAFFIC.

Vessels of the United States had a larger share than those of any other nation in canal traffic, and vessels of the British Empire followed. Japanese and Norwegian ships held third and fourth places, respectively. In cargo tons, American vessels carried approximately 45 per cent of the total; British vessels, 32 per cent; Japanese vessels, 7 per cent; and Norwegian vessels, a little less than 6 per cent. The vessels of these four countries carried, between them, 89 per cent of all the cargo that passed through the canal. Of the nationalities which shared the remaining 11 per cent, the most important were Denmark, Holland, Spain, Sweden, France, and Peru in the order named. A series of articles analyzing the trade by flags has been published in The Panama Canal Record since the close of the fiscal year. The complete figures appear in the table below:

	Number of ships.	United States equivalent tonnage.	Panama Canal net tonnage.	Tolls.	Tons of cargo.
British.....	972	3,241,139	3,978,329	\$3,989,281.58	3,738,257
Belgian.....	2	6,309	8,092	7,886.25	12,700
Brazilian.....	1	3,511	4,566	4,388.75	6,700
Chilean.....	63	104,727	159,727	147,023.75	61,737
Chinese.....	4	10,564	12,098	13,187.10	14,400
Costa Rican.....	16	2,606	2,784	2,952.78	2,112
Cuban.....	1	578	702	722.50	1,200
Danish.....	60	197,504	236,512	241,411.86	322,059
Dutch.....	50	185,561	248,801	229,248.94	216,488
Finnish.....	2	4,293	4,281	5,137.20	7,101
French.....	44	143,113	155,889	164,575.94	132,836
German.....	19	51,561	67,334	62,908.95	73,837
Italian.....	25	82,610	102,783	103,206.60	47,988
Japanese.....	136	538,205	613,245	655,176.51	758,617
Jugo-Slav.....	2	3,902	4,508	4,877.50	8,325
Mexican.....	4	4,133	5,032	4,354.36	3,785
Norwegian.....	140	462,890	548,227	523,311.94	637,887
Panaman.....	8	1,382	1,370	1,463.50	1,500
Peruvian.....	60	86,786	157,495	107,160.64	105,322
Russian.....	4	9,725	11,279	12,156.25	11,343
Spanish.....	44	101,141	117,400	118,548.41	143,076
Swedish.....	25	74,665	113,661	93,331.25	128,919
United States.....	1,210	4,026,961	4,861,761	4,784,577.35	5,163,025
Total.....	2,892	9,343,866	11,415,876	11,276,889.91	11,599,214

LEADING TRADE ROUTES.

The most important trade served by the canal, rated on the basis of cargo tonnage, was that between the east coast of the United States and the west coast of South America. More than 900,000 tons of cargo moved in each direction in this trade. The total of 1,908,858 tons was 16.46 per cent of all the cargo passing through the canal.

The tonnage of cargo handled between the east coast of the United States and the Far East was nearly as great, in the aggregate 1,641,950 tons, or 14.15 per cent of the total. In this trade there was a great preponderance of westbound vessels and cargo over eastbound. The vessels going out to the Orient numbered 187 and those returning only 74. Apparently vessels that go out to the Far East through The Panama Canal commonly return via Suez. From points beyond Manila and Hongkong the Suez route is shorter, and the area beyond the geographical dividing line contains many ports of call which offer cargo to Europe and to the United States.

In the United States coastwise trade 1,641,950 tons of cargo were handled, which represents 11.83 per cent of the total traffic.

The trade between the west coast of the United States and Europe accounted for 1,165,145 tons, and the eastbound vessels and cargo were approximately double the westbound. The cargo handled in this trade was 11.21 per cent of the total.

Particulars of other important trades will be found in the table below. It will be noted that in several of them there is a marked preponderance of traffic in one direction. For instance, in the trade between Europe and the west coast of South America 178 vessels passed from Pacific to Atlantic and only 136 from Atlantic to Pacific. This is accounted for in large part by outward passages via Magellan, although a few vessels reach the west coast from other points in the Pacific, and then load for Europe via Panama. In the trade between Europe and Australia some vessels go out by way of the Cape of Good Hope and return by Panama. In the trade between the east coast of the United States and Australia some ships which go out by Panama return either by the Cape of Good Hope or Suez. The vessels sailing from the east coast of Mexico to Pacific ports north and south of the canal are oil tankers, which return in ballast.

Commercial traffic through The Panama Canal during the fiscal year 1921, classified by leading trade routes.

	Num-ber of shps.	Panama Canal net tonnage.	Tons of cargo.	Percentage of total cargo.
Between east coast of United States and west coast of South America:				
Atlantic to Pacific.....	253	837, 254	933, 261	8. 05
Pacific to Atlantic.....	239	778, 868	975, 597	8. 41
Total.....	492	1, 616, 122	1, 908, 858	16. 46
Between east coast of United States and Far East:				
Atlantic to Pacific.....	187	915, 720	1, 213, 906	10. 46
Pacific to Atlantic.....	74	351, 904	428, 044	3. 69
Total.....	261	1, 267, 624	1, 641, 950	14. 15
United States coastwise:				
Atlantic to Pacific.....	177	783, 420	698, 429	6. 02
Pacific to Atlantic.....	145	647, 557	673, 959	5. 81
Total.....	322	1, 430, 977	1, 372, 388	11. 83
Between west coast of United States and Europe:				
Atlantic to Pacific.....	80	383, 028	144, 591	1. 25
Pacific to Atlantic.....	158	782, 117	1, 154, 840	9. 96
Total.....	238	1, 165, 145	1, 299, 431	11. 21
Between west coast of South America and Europe:				
Atlantic to Pacific.....	136	533, 323	297, 166	2. 56
Pacific to Atlantic.....	178	743, 148	922, 499	7. 95
Total.....	314	1, 276, 471	1, 219, 665	10. 51
Between Australasia and Europe:				
Atlantic to Pacific.....	72	489, 763	391, 848	3. 38
Pacific to Atlantic.....	100	701, 530	579, 745	5. 00
Total.....	172	1, 191, 293	971, 593	8. 38
Between east coast of United States and Australasia:				
Atlantic to Pacific.....	90	476, 854	620, 428	5. 35
Pacific to Atlantic.....	27	156, 283	147, 877	1. 28
Total.....	117	633, 137	768, 305	6. 63
Between east coast of Mexico and west coast of South America:				
Atlantic to Pacific.....	77	383, 466	654, 659	5. 64
Pacific to Atlantic.....	79	400, 455	230	.....
Total.....	156	783, 921	654, 889	5. 64
Between east coast of Mexico and west coast of United States:				
Atlantic to Pacific.....	27	143, 046	261, 205	2. 25
Pacific to Atlantic.....	40	201, 977	8, 155	. 07
Total.....	67	348, 023	269, 360	2. 32
Between Cristobal, Canal Zone, and west coast of South America:				
Atlantic to Pacific.....	151	228, 108	85, 190	. 74
Pacific to Atlantic.....	155	237, 486	139, 547	1. 20
Total.....	306	465, 594	224, 737	1. 94
Miscellaneous trade routes and sailings:				
Atlantic to Pacific.....	207	566, 920	591, 395	5. 10
Pacific to Atlantic.....	224	670, 649	675, 643	5. 83
Total.....	431	1, 237, 569	1, 268, 038	10. 93
Battle ships, cruisers, etc.:				
Atlantic to Pacific.....	14	(1)	.....	.....
Pacific to Atlantic.....	2	(2)	.....	.....
Total.....	16	(3)	.....	.....
Grand total:				
Atlantic to Pacific.....	1, 471	5, 740, 902	5, 892, 078	50. 80
Pacific to Atlantic.....	1, 421	5, 674, 974	5, 707, 136	49. 20
Total.....	2, 892	11, 415, 876	11, 599, 204	100. 00

¹ Panama Canal net tonnage unavailable; displacement tonnage of 87,473.

² Panama Canal net tonnage unavailable; displacement tonnage of 36,888.

³ Total displacement tonnage of 124,361.

PRINCIPAL COMMODITIES.

The principal commodities shipped through the canal during the fiscal year 1921 were:

FROM ATLANTIC TO PACIFIC.

	Tons.
Crude oil.....	1,182,905
Coal and coke.....	767,876
Steel and iron.....	518,269
Refined oil.....	454,837

FROM PACIFIC TO ATLANTIC.

	Tons.
Nitrate.....	1,530,592
Wheat.....	697,168
Food products in cold storage.	408,364
Lumber.....	356,024
Sugar.....	223,315
Flour.....	221,027

Chilean nitrate furnished the heaviest tonnage of any one commodity. In the latter part of the year, owing to the accumulation of unsalable stocks in Europe and the competition of artificial fertilizers, the bottom dropped out of the nitrate market, and shipments were reduced to less than one-third of the usual monthly average.

The wheat shipments from the Pacific coast included a cargo of Canadian wheat from Vancouver to London. The wheat of the prairie Provinces of Manitoba, Saskatchewan, and Alberta usually reaches tidewater for export via the Great Lakes and the St. Lawrence River. This cargo is said to have been the first shipment via Vancouver, the Pacific, and Panama; but it is probable that an important fraction of the Canadian crop will be handled in future over this route.

UNITED STATES COASTWISE TRADE.

It is difficult to determine exactly the volume of the United States coastwise trade through The Panama Canal. Many of the vessels engaging in this trade also call at one or more foreign ports, for example, at Havana and Kingston on the Atlantic side and at Central American and Mexican ports on the west coast. Freight steamers trading between the Atlantic coast and the Orient commonly make Los Angeles, San Francisco, Portland, or Seattle a port of call. Steamers trading from the Atlantic to the Pacific ports of the United States call also at the foreign port of Vancouver. In other words, the domestic trade through the canal is so inextricably bound up with closely related foreign trade that statistical segregation is almost impossible. As nearly as can be determined from data subject to many possibilities of error the coastwise trade during the fiscal year 1921 was as follows:

Direction.	Ships.	Panama Canal net tonnage.	Cargo tons.	Percentage of total cargo.
Atlantic-Pacific.....	177	783,420	698,429	6.02
Pacific-Atlantic.....	145	647,557	673,959	5.81
Total.....	322	1,430,977	1,372,388	11.83

The total number of vessels engaged in the coastwise trade in previous fiscal years was: 1915, 335; 1916, 93; 1917, 35; 1918, 81; 1919, 212; 1920, 248. The coastwise traffic was heaviest in 1915, the first year the canal was open to navigation. The 335 vessels of that year had an aggregate net tonnage of 1,305,291, and carried 1,846,658 tons of cargo. The war resulted in the withdrawal of nearly all vessels from the coastwise trade to war trades in the North Atlantic. Since the armistice the coastwise trade has gradually recovered. However, the figures for 1919 and 1920 are misleading, since they include a large number of wooden and steel steamers built on the west coast, which took one cargo through the canal to the Atlantic coast when they left the shipyards, but never returned to the Pacific. If this fortuitous one-way traffic were disregarded, the totals for 1919 and 1920 would be greatly reduced, and the increase in 1921 would appear more conspicuous.

In any event, there has been a notable increase in the coastwise business during the past fiscal year. New services have been established, and lines already in the trade have increased the number of their sailings. An increasing volume of cargo is offering. For example, lumber shipments from the Pacific northwest to the Atlantic coast during the first quarter of the calendar year 1921 were 42,495,579 feet, as compared with 1,202,229 feet during the same period of the preceding year. California oranges and Washington apples have been shipped successfully through the canal to eastern markets, and the growers' associations have entered into contracts with steamship companies which will result in the diversion of heavy tonnage of fruit shipments from the rail to the water route. Shipments from Atlantic to Pacific have increased in like manner. The competition of the coast-to-coast steamship lines has been felt by the transcontinental railroads, which are reducing freight rates in an effort to hold business. Rapid as the development of the past year has been, it represents a deferred growth. The coastwise trade of 1921 is still below that of 1915, and presumably far short of what it would have been had its normal expansion not been checked by the war.

EFFECT ON REVENUE OF EXEMPTING VESSELS IN THE UNITED STATES COASTWISE TRADE FROM THE PAYMENT OF TOLLS.

The effect on canal revenues of the exemption of American vessels engaged in the coastwise trade of the United States from the payment of tolls would depend on the definition of coastwise trades in the act of exemption. If only those vessels were exempted which traded from one American port to another without calling at any foreign port to load or discharge cargo, the loss of revenue would be less than if the exemption extended to vessels trading from coast to

coast, but calling at intermediate foreign ports or proceeding to a foreign port after first calling at an American port. Serious administrative difficulties would arise in determining the right of exemption unless the meaning of the term "coastwise" were clearly defined in the act. The maximum loss of revenue on the basis of the business of the fiscal year 1921 would be approximately 12.5 per cent of the total receipts from tolls. Data of this trade were furnished to Congress during the year for consideration in connection with legislation looking to the exemption of coastwise vessels from payment of tolls.

LOSS OF REVENUE BY CONTINUING DOUBLE STANDARD OF COLLECTING TOLLS.

The request made in previous years, that legislation be effected which will make the Panama Canal rules of measurement the sole basis for assessing tolls, was reiterated during the past fiscal year.

The present system is to assess tolls, on the basis of \$1.20 a net ton according to Panama Canal measurement, unless this would result in a rate of more than \$1.25 a net ton according to United States rules of measurement. Under this dual system tolls collected amounted to \$11,276,889.61; which is \$1,937,029.04 less than would have been collected if Panama Canal rules only were used. Speedy enactment of a law establishing the single standard is urged.

MOTOR SHIPS.

The number of motor ships using the canal is gradually increasing. During the first six months of the fiscal year 61 were reported, with an aggregate net tonnage of 125,909, and during the second half of the year 74, with an aggregate net tonnage of 202,298. These figures include 36 transits made by a small vessel of 69 net tons trading from Cristobal to Buenaventura in Colombia. Exclusive of this local coastwise traffic, 99 motorships passed through the canal during the year. The majority of them were under the Danish, Swedish, and Norwegian flags.

DETAILS OF THE TRADE.

Further details of the trade through the canal will be found in the following tables in Section V of this report:

Table 49. Summary of Commercial Traffic, 1915-1921.

Table 50. Commercial Traffic by Nationality, 1915-1921.

Tables 53-A, B, and C. Commercial Traffic by Nationality, Tonnage, and Cargo, 1915-1921.

Table 54. By nationality, ships, tonnage, tolls, and cargo, 1915-1921.

Tables 51 and 52. Origin and Destination of Cargo, 1921:

Analyses of various features of the trade are printed from time to time in The Panama Canal Record, published weekly at the Canal Zone.

LOCKAGES.

It is at the locks that the test comes of the capacity of the canal to handle ships. At no time, as yet, has this capacity been seriously tried (see paragraphs on Water Supply), but during the fiscal year there were several days when such conditions were simulated.

On January 19 and 20, 1921, the Atlantic Fleet of the United States Navy made the transit. The first of the ships, a destroyer, entered the canal at 6.18 a. m. on the 19th and the battleship *Oklahoma*, last of the ships for the 19th, entered at 5.20 p. m. Thirteen naval vessels completed the transit that day, and six, which were the battleships, remained in Gatun Lake overnight. On the 20th, at 7.25 p. m., the last of the fleet completed the transit. In those two days a total of 32 naval vessels and 9 commercial vessels made the complete transit from Atlantic to Pacific, and 2 commercial vessels from the Pacific to the Atlantic. The crux of the situation was at Gatun locks, which made 18 lockages in 14 hours 50 minutes on January 19, handling 20 naval vessels, 8 commercial ships, 1 commercial launch, and 1 tug. Among the naval vessels were the battleships *Arizona* and *Pennsylvania*, with a beam of 97 feet, only 13 feet less than the usable width of the locks.

On the return north of the Atlantic Fleet, February 23, the crux was again at Gatun locks, where the west chamber had been unwatered while repairs were being made. Working one chamber only, 17 lockages were made in 20 hours, with a waiting interval of 2 hours and 20 minutes, or actual operating time of 17 hours 40 minutes. During this time 24 naval vessels and 4 commercial ships passed through the locks.

On her return from Australia the British battle cruiser *Renown*, bearing the Prince of Wales, passed through the canal on September 13, 1920. This is the longest vessel that has made the transit—dimensions, 795 feet by 31 feet draught in salt water.

The U. S. battleship *Tennessee* made the transit on June 8, 1921, entering the Atlantic entrance of the canal at 8 a. m. and passing out the Pacific entrance at 5.55 p. m. This is the ship of greatest beam that passed through the canal in the fiscal year—dimensions, 624 feet by 97 feet 3½ inches by 34 feet draught in salt water. The battleships *Mississippi* and *New Mexico* are 1 inch greater in beam than the *Tennessee*, but their transit was made in the previous year.

A statement of the lockages and vessels handled each month of the fiscal year follows:

Month.	Gatun.		Pedro Miguel.		Miraflones.		Total.	
	Lock-ages.	Ves-sels.	Lock-ages.	Ves-sels.	Lock-ages.	Ves-sels.	Lock-ages.	Ves-sels.
1920.								
July.....	235	285	253	297	248	300	736	882
August.....	268	335	292	355	294	358	854	1,048
September.....	257	296	283	316	278	321	798	933
October.....	250	296	263	305	266	310	779	911
November.....	246	292	266	293	266	288	778	873
December.....	278	320	265	345	299	343	842	1,008
1921.								
January.....	313	392	334	413	328	389	975	1,194
February.....	258	371	325	419	308	408	891	1,198
March.....	250	321	296	367	282	335	828	1,023
April.....	229	283	271	336	260	312	760	931
May.....	206	262	238	284	237	290	681	836
June.....	205	256	230	273	225	269	660	798
Total.....	2,995	3,709	3,316	4,003	3,291	3,923	9,602	11,635

The total number of lockages in the years 1915-1921 is as follows:

Fiscal year:		Fiscal year:	
1915 ¹	3,676	1919.....	6,938
1916. ²	2,876	1920.....	8,149
1917.....	5,994	1921.....	9,602
1918.....	7,034		

It will be noted that in the case of the larger battleships the beam of vessel is approaching the maximum allowable lock space. Anticipating future needs, studies have been made for the construction of locks that will accommodate vessels of greater beam than can pass the present locks. The construction of such locks without disturbing the functioning of the present locks is entirely feasible.

LOCK MAINTENANCE.

The plan of operating in two shifts was continued at all locks, the hours of work being so arranged that the whole force is available for the "peak load" of putting vessels through the locks, and that each shift will work full eight hours on operation or maintenance.

In addition to current maintenance work, the chambers at Gatun and one of those at Pedro Miguel locks were unwatered and repairs and painting were done. The work at Pedro Miguel required from November 29 to January 13; at Gatun, from January 30 to May 10.

All of the 44 towing locomotives in use at the locks gave excellent service during the year. Five new locomotives are being built at Balboa shops, and the electrical equipment for them has been purchased in the United States.

There has been no repetition of the eating away of lead sheaths of cables by leakage water, as reported in the 1918 annual report, but a unique case of trouble developed at Pedro Miguel locks in May when the control cable for cylindrical valve No. 609 was found in

¹ Canal opened to commercial traffic Aug. 15, 1914.

² Canal closed account of slides, Sept. 18, 1915, to Apr. 15, 1916.

bad condition. Upon investigation the trouble was located 450 feet from the valve and was caused by ants eating through the cable insulation.

The chain fenders were called upon to operate in one emergency during the year, this accident occurring at Gatun when the United States destroyer *Satterlee* was rammed by the destroyer *Mason*, parting all lines on the former and pushing her ahead about 300 feet and against the chain fender. The fender functioned properly, stopping both ships, although the bow of the *Satterlee* was opened up at the point of contact with the chain.

POWER FOR CANAL OPERATION.

The generator output of the hydroelectric plant at Gatun was 70,883,000 kilowatt hours, and of the auxiliary steam plant at Miraflores 620,930 kilowatt hours.

The power system was operated throughout the year with an average combined generator output of 5,958,660 kilowatt hours per month, as compared with an average combined generator output of 5,382,750 kilowatt hours per month last year. An average of 4,991,677 kilowatt hours per month was transmitted and distributed to all power consumers this year as compared with a corresponding average of 4,608,341 kilowatt hours per month for last year. From the above there results a power system transmission and distribution loss of 16.23 per cent this year as compared with a corresponding loss of 14.4 per cent last year.

The steam plant at Miraflores was maintained and operated on the basis of stand-by service, for which the average fuel consumption was 2,313 barrels per month, compared with the corresponding rate of 2,311 barrels per month last year. Incidental to the stand-by service, the two units kept "floating" upon the line perform a valuable function as synchronous condensers for power factor improvement and voltage regulation.

The average cost of distributed power for the year was 8.886 mills a kilowatt hour as compared with a corresponding cost of 9.421 mills last year. The average cost of distributed lighting current, including lamp renewals, was 13.023 mills a kilowatt hour this year, as compared with a corresponding cost of 13.277 mills last year. The decreases in the unit costs of power and lighting current have been caused largely by the fact that it was not necessary to assume part of the hydro station load by the Miraflores steam plant during the past dry season.

The percentage distribution of power was approximately as follows: Locks, 8; Panama Railroad, 17; municipal water pumping, 17; lighting quarters, 13; mechanical division shops, 14; dredging and sluicing, 5; Army and Navy, 10; health, 2; building rental, 4; general and miscellaneous, 10.

WATER SUPPLY FOR GATUN LAKE.

The question of water supply for Gatun Lake has at no time been lost sight of; and at the close of the dry season of 1920, when new low records in the lake were made, former studies were revised on the basis of the new data. These studies were continued during the past fiscal year along three lines—(a) water for lockages, (b) water for electric power, (c) development of further sources of supply. All these studies are available but are of technical nature and too extensive for an administrative report.

So far as water for lockages is concerned, there is no immediate prospect of lack of sufficient water to handle all traffic that may develop within 10 years under any dry-season conditions that can be expected. Theoretically, we plan to have not less than 40 feet of water over the lock sills and through Gaillard Cut at the lowest stage of the lake; but actually traffic can move without so much; in fact, we could handle any ships that have offered themselves thus far with considerably less depth of water.

On January 1, 1921, Gatun Lake was at elevation plus 86.98. The dry season began about December 8, 1920, and the lake gradually fell to a minimum elevation of plus 82 on May 22, 1921. The consumption of water from Gatun Lake, the greatest of record, in the calendar year 1920, was due to causes with percentages as follows: Spillway discharge, 47; hydroelectric power, 26; evaporation, 13; lockages, 12; municipal and miscellaneous, 2. Spillway discharge represents the amount necessary to waste to keep the lake level to prescribed height. No transfer of power generation from the hydroelectric to the steam plant was necessary in the dry season of 1921. With present facilities the canal can take care of 30 lockages a day (approximately 45 vessels), or four times our present traffic, provided a steam plant be provided sufficient to carry the power demand during the entire dry season; or it can carry 24 lockages a day (about 36 vessels) with the hydroelectric plant operating through the dry season to 14 per cent of its capacity. The above figures are based on a repetition of the driest dry season of record and on keeping the lake not lower than minimum level of plus 80.

MAINTENANCE OF CHANNEL.

Channel maintenance involves dredging on account of silting and on account of slides from the banks. A minor item is keeping the channel in the lake free from water plants, which grow rapidly and in a short time would impede navigation if the growth were not checked. No delays to vessels were caused by slides during the year.

Slides in Gaillard Cut were active during the year, but not so as seriously to menace freedom of navigation. At Cucaracha, on the

south side of Gold Hill, a general movement continued over the entire area but varying from month to month. A basin of 3.5 acres in extent was dredged to a depth of from 30 to 35 feet outside the east prism line, thus providing space outside the canal for about one-quarter of a million cubic yards of sliding material. Dredges removed from this basin 1,299,500 cubic yards of rock and earth.

Culebra slides were fairly quiescent, but the dredges removed 489,800 cubic yards of earth and rock from in front of them.

A statement of all the maintenance dredging for the canal prism follows:

Location:	Cubic yards.
Atlantic entrance.....	596, 400
Gatun Lake.....	111, 900
Gaillard Cut.....	2, 076, 600
Miraflores Lake.....	586, 300
Pacific entrance.....	664, 700
Total.....	4, 035, 900

The maintenance of channel work requires a readiness that can be likened to that of a fire department. Ordinary silting could be cared for in routine manner, but the slides are always a potential menace to brief closures, and only the most prompt measures are a guaranty that we can keep the channel open at all times. An instance of this occurred on July 14, 1921, the new fiscal year, when the bank of the Cut half a mile north of East Culebra gave way, and 185,000 cubic yards of rock and earth moved into the prism, causing shoaling entirely across the channel. Two dipper dredges were immediately set at work, with the result that there was a delay of only a few hours on July 15, and on July 16 three of our largest battleships passed through.

AIDS TO NAVIGATION.

The work of maintaining lights along the canal channel and in waters near the canal was continued. The lighthouses maintained are at Roncador, Serrana Bank, and Quita Sueno, off the Atlantic entrance; Toro Point and East Breakwater, at the Atlantic entrance; and at the Pacific entrance at Taboguilla, San Jose, and Bona Islands, and at Cape Mala. Two additional lights were added to those maintained and operated by the canal during the year—the East Breakwater upper and lower lights. The upper light consists of a complex flasher, giving two short and a long flash. This light can not be mistaken for any other and is visible 16 miles at sea. In the canal proper, maintenance included 85 beacons, 73 gas buoys, 76 spar buoys, and, in addition, 108 electric lights in Gaillard Cut.

ACCIDENTS.

No accident of serious moment occurred to any ship in the canal during the year. Investigations were made in 39 cases, as follows: Struck banks, 5; accidents at locks or in approaches thereto, 12; col-

lision with other ships, 3; damage from tugs while maneuvering in close waters, 8; struck pier or landing stage, 8; struck dredge in Gaillard Cut, 1; unclassified, 2. The total damages were estimated at about \$80,000. The canal assumed responsibility for repairs in 20 cases, and the total cost thereof was \$11,385.57. Among the cases in which the canal did not assume responsibility the greatest single damage was to a ship that struck the west bank of the canal just south of Miraflores locks on February 21, 1921, with estimated damage of \$17,000. The second greatest was for \$16,000, caused by a collision in Gatun Lake, when one of two northbound ships bumped another, having started to pass it but being forced to drop astern on account of a vessel approaching southbound. Accidents at the locks were confined to damages of so slight a nature that no claim was made to repairs costing \$500, except in one case. This was the accident to the *Orteric*, southbound, August 3, 1920, at Pedro Miguel lock. The ship had proceeded a short distance into the east chamber under control of the towing locomotives, when the gates began to close, striking the ship on both sides. The accident was due to misinterpretation of signals given by the lock supervisor to the control house. The repairs were made by The Panama Canal at a cost of \$1,571.06, with \$4,191.05 additional payment to owners in settlement of other expenses due to the accident.

In every case of accident a thorough investigation is made both to place responsibility and to provide against recurrence. It is believed that the handling of 4,160 vessels in close quarters with only the accidents enumerated above is a high tribute to the effectiveness of the canal operation force. On the other hand, the money damage that can be caused to a ship by an accident that may not even impede her voyage is an indication of the need for great care in handling vessels at the canal.

SALVAGE WORK.

A salvage section was organized during the year. The wrecking tug *Favorite* (500 deadweight tons), obtained from the Navy at the close of the fiscal year 1920, and all of the salvage equipment at the canal of value in this class of work were turned over to the new section. Its headquarters are at Gatun, in the lake, from which place calls can be answered expeditiously from either ocean. A skeleton organization of experienced salvors is maintained, and men are drawn from other parts of the work as emergencies demand. A schedule of rates for salvage work was in preparation at the close of this fiscal year.

The *Favorite* was dispatched on June 29, 1920, to assist the steamship *Kôyo Maru*, which had run upon Serrana Bank, about 300 miles north of the Atlantic entrance to the canal. A Lloyd's

tug had the work in charge, but the greater capacity of the *Favorite* made her work of greater value. The ship was lightened, pulled off the bank, and brought to Balboa shops, where repairs were made. The owners expressed their satisfaction with the work done by the *Favorite* and with the low salvage charges.

The steamship *Sussex* stranded on the West Breakwater at the Atlantic entrance of the canal on the night of January 3, 1921, and the *Favorite* was sent to her assistance. After continuous efforts in sloppy weather, with a heavy ground swell impeding the work, the ship was pulled off on January 11 and taken to Balboa dry dock for repairs.

On November 9, 1920, the *Favorite* accompanied the Navy tug *Sciota* to Cartagena, Colombia, to assist in pulling the U. S. S. *Cleveland* off the bank at the entrance of that harbor. She worked from the morning of November 10 until noon of the 11th, when the *Cleveland* slid into deep water. The captain of the *Cleveland* expressed great satisfaction with the work of the *Favorite* and her crew.

The Governor had issued a circular on June 20, 1920, requesting employees engaged on salvage work not to institute libel proceedings before consulting with him. This was in connection with claims against the *Olockson*, which burned at sea off the Pacific entrance of the canal in March, 1920. The case is pending in the Canal Zone District Court.

On February 21, 1921, the Governor directed that employees be advised as follows regarding salvage of vessels in canal waters:

Quite recently the Governor has had a request from an employee for permission to libel a vessel which caught fire while lying at a pier in the harbor of Balboa. This employee was on duty at the time he proceeded to the assistance of the vessel, although not on duty with reference to that vessel.

It is the belief of the Governor that all employees of The Panama Canal should be considered available for such emergency work and is involved in rendering assistance to a vessel on fire within the confines of the port of Balboa without laying the vessel liable to libel for salvage. The Governor considers that all shipping within the canal prism, or, to be exact, within the limits marked by the sea buoys at Balboa and the breakwater at Cristobal, have a right to expect any assistance from the equipment and personnel of The Panama Canal which is necessary for their proper care, preservation, and handling in Canal Zone waters.

He believes that the equipment of the Canal Zone is maintained for the above purpose; and that the reputation of the canal for fair dealing requires that the above viewpoint be insisted upon and maintained. In view of the above, the Governor will not approve in future any proposal to libel vessels for assistance in emergencies within the canal waters; and if any such libel is placed by a canal employee it will be considered that such employee has taken action which is inimical to the best interests of the canal, even though such action technically be within the law.

The case in point was that of the steamship *Azeus*, carrying nitrate, which caught fire on January 19, 1921, while the ship was in dock at Balboa. The damage was \$90,000.

SECTION II.

BUSINESS OPERATIONS.

The policy of supplying vessels using the canal or its ports and employees of the United States Government on the Isthmus with all articles necessary or convenient for their use was continued throughout the year. This is a necessary corollary of the canal operation so far as maintenance of force is concerned, and is a great convenience to shipping. It involves the operation of various enterprises that in the United States would commonly be carried on by private persons. In fact, all the business operations of a small-sized industrial community in the United States are here carried on by the Government.

Considered from a money standpoint, these operations are divided into two classes: (1) Work done for The Panama Canal, which is paid for from appropriations and other revenues and on which no profit is made; (2) work done for the Panama Railroad, other departments of the United States Government, and individuals and companies. In this section the figures of value of work done apply to the whole volume of work. Operations on a strictly commercial basis, where it is planned to make a nominal profit, are carried on in two main divisions—(a) operations under The Panama Canal, and (b) operations under the Panama Railroad. The detail for these commercial operations of The Panama Canal will be found in Table 17 of Section V, and a summary for the Panama Railroad on the Isthmus in Table 48 of Section V. The business by divisions was as follows:

Business operations.

	Gross revenue.	Net revenue.
Panama Canal:		
Mechanical division.....	\$4,900,228.20	\$146,768.47
Other operation and maintenance, divisions.....	4,113,335.26	¹ 103,764.82
Supply department—		
Subsistence.....	1,093,709.89	¹ 93,423.46
Quartermaster.....	3,923,208.21	585,154.19
Accounting department.....	285,262.37	975.67
Health department.....	680,355.40	13,123.34
Civil government.....	65,187.91	47.56
Executive department.....	121,036.91	128.92
Miscellaneous.....	49,992.93	15,201.33
Total.....	15,232,317.08	564,211.20
Panama Railroad:		
Railroad proper.....	2,242,021.69	¹ 156,713.23
Commissary.....	11,112,334.29	¹ 216,992.59
Coaling plants.....	7,400,758.15	373,323.63
Harbor terminal operations.....	1,505,810.95	¹ 22,878.56
Rental of lands.....	120,865.42	107,823.04
Telephones.....	193,920.80	¹ 5,393.74
Hotel Washington.....	231,805.89	14,778.08
Motor shop.....	86,960.45	3,778.75
Plantations.....	67,448.66	¹ 9,408.18
Cattle steamers.....	289,353.85	.....
Cattle industry.....	1,221,229.54	15,023.82
Poultry farm.....	10,649.57	¹ 17,939.00
Hog farm.....	109,755.33	¹ 11,845.92
Dairy farm.....	64,975.29	5,418.26
Miscellaneous.....	69,930.63	14,853.75
Steamship line.....	5,156,446.84	¹ 700,810.22
Total.....	29,884,267.35	¹ 606,982.11

¹ Loss.

The losses under The Panama Canal are shown in detail in Table 17 of Section V. The losses under commissary are due to liquidation on a falling market; those of the railroad and of the steamship line to the general business depression aggravated by the strike of marine engineers.

REPAIRS TO VESSELS—MECHANICAL WORK.

The mechanical shops were operated during the fiscal year for the dual purpose of upkeep of canal equipment and plant and of serving shipping. This is the only point within 1,800 miles where large ships can dry dock and be repaired. The work of the year was as follows:

Class.	Amount.	Per cent of total.
Marine.....	\$4,051,475.82	59.38
Railroad.....	1,068,160.43	15.65
Miscellaneous.....	952,911.07	13.97
Manufacture.....	750,701.10	11.00

Of this amount \$2,687,536.36 worth was done for individuals and companies; \$2,354,519.46 for The Panama Canal; \$1,387,178.45 for the Panama Railroad; and \$394,014.15 for other departments of the Government. Attention is called to the fact that work for The Panama Canal amounted to one-third of the whole.

Commercial business.—The rebuilding and reconditioning of the steamship *Marne*, owned and operated by the United States Shipping Board, was the largest single job of the year. The ship had been damaged by several fires and explosions in the cargo of benzine and had been sunk by shell fire to extinguish the fire. The damage consisted of that from fire, explosion, shell fire, and submergence in salt water, and to repair this it was necessary to perform work on practically every part of the vessel. Work was begun on the ship on July 5, 1920, and she was turned over to the Shipping Board representative on the Isthmus, ready for operation, on February 16, 1921. The cost of repairs was \$740,887.85.

Other big repair jobs were as follows: Repairs to the bottom of the *Koyo Maru*, where she had run upon Serrana Bank; extensive repairs to the *General H. F. Hodges*; dry docking and repair of the Chilean battleship *Almirante Latorre*, 32,000 tons displacement; repairs to the bottom of the steamship *Sussex*, which ran upon Cristobal Breakwater; extensive repairs to the Spanish battleship *Espana*, which ran upon the rocks off the coast of Chile; repairs to tail shaft and stern tube of the *Bonham*, use of a cofferdam being necessary; extensive repairs to the steamship *North American*, which ran upon the rocks off the coast of Ecuador.

The total number of vessels other than tugs, barges, and dredges of The Panama Canal upon which work was done during the past year was, at Balboa, 252; at Cristobal, 419; total, 671.

Work for the Navy.—The more important work done for the Navy was: Repairing damage suffered by the *Tacoma* in collision with a tug and also repairing main engine and auxiliaries: dry-docking of the superdreadnaught *New Mexico*; extensive boiler repairs on the *Neches*; repairing damage sustained in collision by the *Mason* and the *Satterlee*; dry docking and miscellaneous work to submarines stationed at the Isthmus; overhaul of main turbines and reduction gears of the *Eagle*; repairs to the *S. P. 2235* required for permitting that vessel to be towed to Puget Sound.

Work for The Panama Canal.—Restoration of *Culebra* from cattle ship to seagoing suction dredge; repairs and alterations, including conversion to oil burner of tug *Bohio*; repairs to steamship *Caribbean*, including hull and machinery work; overhaul of the dipper dredge *Cascadas*; overhaul of various dredges, scows, and barges.

Dry docking.—Twenty-four pieces of Panama Canal equipment were handled in the dry dock at Balboa and 25 in the dry dock at Cristobal. Vessels other than canal equipment dry-docked at Balboa numbered 62, at Cristobal 42.

Work for Panama Railroad.—In addition to the routine work of operating the Balboa and Cristobal roundhouses, the following important items of work were done for the Panama Railroad on the Isthmus: Retirement of 23 of the 201 class locomotives and storing of the same; retirement and storage of 933 pieces of freight rolling stock on account of reduced business; construction of 3 new parlor cars; retirement and scrapping of 7 of the old 45-foot passenger cars, in accordance with a policy looking to the retirement of 17 of these coaches in a period of three years; car inspection and repair service for all rolling stock.

Decrease in commercial business.—The general depression in the shipping world and reductions of appropriations to Government departments, limiting the amount of repair work which may be done to Government vessels, resulted in a falling off of business during the second half of the fiscal year. The following comparative statement of revenues from commercial business (not including work for The Panama Canal) for the fiscal years ending June 30, 1920 and 1921, indicates the trend:

	Fiscal year 1920.	Fiscal year 1921.		Fiscal year 1920.	Fiscal year 1921.
July.....	\$435,270.60	\$391,010.01	February.....	\$391,638.65	\$325,459.40
August.....	424,630.70	488,567.07	March.....	634,290.68	668,534.65
September.....	275,522.01	446,263.68	April.....	405,468.71	252,572.59
October.....	480,510.03	476,357.07	May.....	277,660.35	395,769.22
November.....	525,179.53	364,957.82	June.....	455,732.25	387,720.96
December.....	458,988.75	321,397.26			
January.....	445,730.80	381,618.47	Total.....	5,210,623.06	4,900,228.20

The force was reduced from 2,856 in July, 1920, to 1,835 in June, 1921. At the beginning of the fiscal year there were 1,003 gold roll, or American, employees, and at the end of the fiscal year, 644. The present volume of business is insufficient properly to support a mechanical plant the size of that on the Isthmus, and the decrease has resulted in a reduction of personnel beyond the point which is proper for a permanent force. In normal times the business from commercial shipping will carry the operating and maintenance charges of these shops, but under conditions existing at present this is not true. So far as possible, the routine repair work of The Panama Canal and the Panama Railroad has been distributed so as to come at times when other work was slack, and this has helped materially to hold the force together. A shop plant is necessary for handling repair work for the canal organization; and shops of the present magnitude are essential for a proper handling of repairs to commercial shipping and the vessels of the Navy that may call here. So far as is possible this business is made self-supporting and it has been so up to the present, but the necessity for maintaining here proper facilities for naval vessels should be considered in connection with a study of the work done in past years and of the conditions that confront this, in common with all marine repair establishments, during the coming year. The maintenance of adequate repair facilities at the Isthmus is a well-established part of the policy that has guided our Government from the beginning with relation to The Panama Canal; namely, to make the canal not only a waterway, but also a maritime service station. It is believed that this policy is wise, both from a purely commercial point of view and from the standpoint of the value of such a service station to both the Navy and Army, and the continuance of this policy is earnestly recommended.

COAL.

Coal was supplied to commercial vessels at the coaling plants at Cristobal and Balboa; a total of 424,680 tons. The total coaling business was as follows:

	1921	1920		1921	1920
	<i>Tons.</i>	<i>Tons.</i>		<i>Tons.</i>	<i>Tons.</i>
Commercial vessels.....	424,680	479,488	United States Navy ¹.....	.....	18,739
Panama Railroad.....	9,622	24,519	Miscellaneous.....	5,278	5,034
Panama Canal.....	20,817	19,409			
United States Army.....	8,418	10,960		468,815	558,149

¹ Navy maintains its own supply; from which 76,129 tons were delivered.

The total coal on hand June 30, 1920, was 58,652 tons; received during the year, 554,846 tons; sold, 468,815 tons. Receipts from sales, including charges for handling Navy coal, were \$7,400,758.15;

cost of repairs and depreciation of plant, and of handling coal was \$1,883,828.32; and the profits amounted to \$373,323.63.

The policy of bunkering vessels as rapidly as possible was continued, and among the records made were the following:

Name of ship.	Amount.	Date.	Time.	Name of ship.	Amount.	Date.	Time.
	<i>Tons.</i>		<i>H. m.</i>		<i>Tons.</i>		<i>H. m.</i>
Wiltshire.....	1,102	Nov. 25, 1920	1 25	Antillian.....	77	May 11, 1921	0 10
Maimoa.....	656	May 10, 1921	45	Cape Henry.....	285	May 17, 1921	20
Athentic.....	2,005	.....do.....	10 20	Transvaal.....	53	June 1, 1921	5

The sales fell from a monthly average of 43,000 tons during the first seven months of the year to an average of 34,000 tons during the last five months, because of the general shipping depression. The plan of handling in three 8-hour shifts was discontinued in March, in favor of a 2-shift plan with overtime in case of vessels that have not completed loading before 11 p. m.

The price of coal trimmed in bunkers at Cristobal on July 1, 1920, was \$13.50 per ton of 2,240 pounds; September 15, \$15; October 26, \$18; March 12, 1921, \$12; June 1, \$14.

Changes were made in the plant during the year in keeping with the general program for improving the service. The wharf bunker, originally designed for coaling barges and tugs through long chutes, was redesigned and two 30-foot booms operating on swing circles were installed, making an additional berth at which ships may be coaled. Barges 15 and 21 were reconstructed along lines of the latest type of De Mayo barges with steel superstructure substituted for wood and each barge equipped with two 40-foot conveyors, the capacity of each barge being thereby increased from 75 to 200 tons an hour. Studies were made of a project for affixing a reloader attachment to one of the unloaders for the purpose of making an additional berth for bunkering ships. At present three large ships can take bunkers at berths at the coaling plant while two colliers are unloading. Under the new plan, one of the unloading berths would become available for bunkering or for unloading. Four De Mayo barges of improved type are available for bunkering work at the cargo docks or in the bay. Improvements made in the unloading machinery, together with installation of oil-burning equipment, increased the unloading capacity. The plant recently unloaded the steamship *Cristobal* carrying 9,611 gross tons, in 29 working hours; and this ship was not built as a collier. The colliers *Ulysses* and *Achilles*, carrying 12,000 tons, have been discharged in 15 hours.

The general subject of coaling at the canal is touched upon in Section I, under the caption "The canal in competition with other routes."

FUEL OIL, DIESEL OIL, GASOLINE.

At both entrances of the canal fuel oil is piped from tanks of The Panama Canal and tanks owned by various private companies to the docks. The canal organization does the pumping for both its own and private supplies. The tank farm at the Atlantic entrance consists of 3 tanks of The Panama Canal, capacity 140,633 barrels, and 12 tanks of private companies, capacity 664,108 barrels; at the Pacific entrance, 4 tanks of The Panama Canal, capacity 195,743 barrels; and 9 tanks of private companies, capacity 369,672 barrels. This includes two 55,000-barrel concrete tanks erected during the year by the canal, and four of the same capacity erected by private companies. The canal began construction of two 12-inch pipe lines for crude oil, each 14,000 feet in length, from the tank farm to the piers at Cristobal, with the purpose of improving the service of delivery to ships. A statement of the fuel oil handled during the year follows:

	Balboa.	Cristobal.	Total.
Number of barrels received by Panama Canal.....	547,801	314,625	862,426
Number of barrels used by Panama Canal.....	266,477	93,322	359,799
Number of barrels pumped for individuals and companies.....	1,954,393	2,611,391	4,565,784

The service to ships was as follows:

Item sold by—	Cristobal		Balboa.		Total.	
	Ships.	Barrels. ¹	Ships.	Barrels. ¹	Ships.	Barrels.
FUEL OIL.						
Panama Canal.....	60	156,977	76	135,366	136	292,343
Private companies.....	621	1,110,764	316	713,495	937	1,824,259
DIESEL OIL.						
Panama Canal.....	9	1,719			9	1,719
Private companies.....			93	132,090	93	132,090
GASOLINE.²						
Panama Canal.....	20	³ 26,795	17	³ 16,390	37	³ 43,185

¹ Barrel of 42 gallons.

² Bulk sales to ships only.

³ Gallons.

The above does not include sales to Panama Canal vessels.

The price of oil from Panama Canal tanks, per barrel of 42 gallons, on July 1, 1920, was \$3.50; on March 10, 1921, \$2.75; at which price it continued to the end of the year. The policy of the canal is to fix a price which will permit a fair profit to the private companies in the business, yet beyond which they can not go and retain business. Private companies frequently quote lower prices

than those quoted by the canal. The commercial fuel oil, Diesel oil, and gasoline business of the canal amounted to \$1,076,925.43, with a net profit of \$559,104.72. The plants operated on a three-shift or continuous basis, until June 1, 1921, when a two-shift system, with an extra charge for overtime in case of fueling during the 11 to 7 shift was instituted.

Diesel oil.—A cargo of Diesel oil was purchased and stored at the Atlantic entrance tank farm. It consisted of 53,919 barrels. The storage capacity of the canal is 55,954 barrels at Atlantic entrance, 4,038 barrels at Pacific entrance, price \$4 a barrel of 42 gallons. Diesel oil is also carried by private companies with storage tanks at the canal. A new 6-inch pipe line from the tank farm to the harbor at Cristobal, 14,000 feet, was begun during the year, as an addition to present facilities for handling Diesel.

Gasoline.—Storage of gasoline at both entrances of the canal was continued. The receipts for the year were 427,953 gallons.

SHIP CHANDLERY AND OTHER SUPPLIES—STOREHOUSE OPERATIONS.

The storehouses of The Panama Canal, situated at both termini of the canal, and at Paraiso, were continued as the agency through which materials were issued to all parts of the canal and railroad work, and were sold to the Army and Navy and steamships and other non-Government interests. The value of material received during the year at the storehouses was \$14,025,216.21. This represents material received from the United States and material forwarded to the storehouses by other departments and divisions of the canal. The following statement indicates the status of material on hand, received, issued, etc., during the year:

On hand June 30, 1920.....	\$5, 280, 367. 24
Received during year.....	14, 025, 216. 21
	<hr/>
Total.....	19, 305, 583. 45
Issued during year.....	10, 790, 198. 46
	<hr/>
On hand June 30, 1921.....	8, 515, 384. 99

The value of sales to steamships was \$290,466.32, which does not include stock issued to the mechanical shops for use in repairs to steamships. Sales to the Army and Navy and private companies operating at the canal amounted to \$1,750,010.80. This makes the total value of sales from the storehouses, to other than The Panama Canal and Panama Railroad, \$2,040,477.12. The value of issues to The Panama Canal and Panama Railroad was \$8,749,721.34. Toward the end of the year steps were taken to reduce the

amount of stock in storehouses, especially items on which turnover is slow, in order that the capital tied up in this way may be released.

The concentration of obsolete and scrap material and equipment for sale was continued. There were 8,366 tons of American scrap material and 2,412 tons of French scrap material sold during the year. Arrangements have also been made at Cristobal for storage of equipment held in reserve for future use.

CARGO HANDLING AT PIERS.

The work of loading, discharging, and interchanging cargoes between various vessels at the Atlantic and Pacific terminals of the canal was continued without serious interruption or damage to locks, floating equipment, or other property. The system of continuous operation, where ship demands, was continued.

The following table shows work performed during the fiscal years 1921 and 1920:

Item.	1921	1920
Tons of cargo stevedored	442,756	663,295
Revenue per ton stevedored, average.....	\$0.4832	\$0.4291
Cost per ton stevedored	\$0.5327	\$0.3949
Tons of cargo handled and transferred.....	1,109,726	1,480,436
Revenue per ton handled, average.....	\$1.0095	\$0.9632
Cost per ton handled.....	\$0.8589	\$0.7664
Gross operating revenue.....	\$1,505,810.95	\$1,878,518.95
Gross operating expenses.....	\$1,523,689.51	\$1,741,800.76
Net revenue.....	¹ \$22,878.56	\$136,718.19
Per cent of expenses to revenue.....	101.52	92.72

¹ Loss.

The distribution of cargo handled for the fiscal year 1921 is as follows:

	Balboa.	Cristobal.
Number of ships discharging cargo.....	368	1,000
Tons of cargo received (ex cargo).....	50,080	553,624
Number of ships taking cargo.....	277	789
Tons of cargo delivered (per cargo).....	40,279	404,581
Total number of tons stevedored by Panama R. R. Co.....	16,288	426,468
Total number of tons rehandled by Panama R. R. Co.....	10,802	38,418

Cargoes of nine vessels which were in distress due to accidents were also unloaded to enable the ships to have necessary repairs made at the shops.

Due to various causes, the volume of cargo transshipped at the Isthmus materially decreased during the year. A noticeable decline commenced with the month of April, 1920, and the downward trend continued until May, 1921, since which time a gradual increase has been shown.

The revenue this year was \$1,505,810.95, a decrease of \$372,708 as compared with last year. The cost of operation was \$1,528,689.51, a decrease of \$213,111.25 over last year, resulting in a loss of \$22,878.56 as compared with a profit of \$136,718.19 last year.

COMMISSARY SYSTEM.

The commissary system, consisting of purchasing agencies, 7 manufacturing plants, wholesale departments, and 12 retail stores, was continued as a branch of the Panama Railroad Co. The receipts from the sale of commissary supplies amounted to \$11,112,334.29, a decrease of \$1,115,137.78, as compared with the previous year. The business lost was \$216,992.59, as compared with a profit of \$276,-093.40 last year. The loss on sales was approximately 2 per cent. This loss is due to the shrinkage of value of goods on hand and the reduction in business because of decrease in force and general business depression.

Purchases.—Most of the stock, except meats, is purchased in the United States, and therefore the business on the Isthmus reflects the varying phases of business in the States. The system is self-sustaining in fullest sense, receiving no financial aid from sources outside itself. Goods are sold at a price that represents cost laid down on the Isthmus plus a surcharge based on the cost of handling and retailing on the Isthmus. A general idea of the trend of commissary prices can be obtained from the discussion of cost of living in Section IV of this report. The following statement summarizes the business:

Cost by class of commodities purchased and sold, fiscal year 1921, together with surcharge added to cost to make sale prices.

	On hand June 30, 1920.	Purchases.	On hand June 30, 1921.	Sold.	Per cent surcharge.
Grocery.....	\$597,464.26	\$1,976,383.51	\$190,251.19	\$2,383,596.58	9.82
Hardware.....	139,747.80	370,911.75	116,845.47	393,814.08	21.82
Dry goods.....	982,720.41	1,261,461.47	735,553.47	1,508,628.41	28.32
Boots and shoes.....	318,960.85	278,236.96	289,828.50	307,369.31	26.82
Cold storage.....	152,461.37	2,114,724.31	118,681.08	2,148,504.60	20.44
Tobacco.....	38,752.85	348,389.41	27,134.74	360,007.52	55.83
Raw material.....	408,608.18	¹ 1,745,931.94	503,299.42	1,651,240.70	.09
Total.....	2,638,715.72	8,096,039.35	1,981,593.87	8,753,161.20	.....

¹ Includes cattle, hogs, poultry, and milk in amount of \$1,386,319.35.

Purchases were made as follows: United States, \$5,381,279.20; foreign, \$526,412.03; Central and South America, \$185,963.98; cattle industry, \$1,489,431.90; local purchases, \$394,716.96; Panama Canal, \$118,235.28; total, \$8,096,039.35.

Sales.—Sales were made as follows:

	1920	1921	Decrease 1921 under 1920.
To United States Government.....	\$2, 161, 118. 46	\$1, 736, 682. 50	\$424, 435. 96
Panama Canal.....	1, 558, 588. 17	1, 568, 167. 58	1 9, 579. 41
Steamships.....	1, 119, 852. 93	949, 380. 29	70, 472. 64
Panama R. R. Co.....	411, 480. 95	348, 485. 58	62, 995. 37
Individuals and companies.....	272, 866. 75	313, 845. 66	1 40, 978. 91
Sales to employees.....	6, 883, 513. 80	6, 414, 813. 91	468, 699. 89
Gross revenue from sales.....	12, 407, 421. 06	11, 331, 375. 52	1, 076, 045. 54
Less discounts and credit notes.....	179, 948. 99	219, 041. 23	1 39, 092. 24
Total.....	12, 227, 472. 07	11, 112, 334. 29	1, 115, 137. 78
Supplies for expense and equipment:			
Commissaries.....	181, 849. 64	149, 698. 23	32, 150. 81
General.....	1, 023. 09	705. 60	317. 49
Plants.....	131, 108. 20	110, 336. 57	20, 771. 63
Total.....	313, 980. 33	260, 740. 40	53, 239. 93
Loss by condemnation, shrinkage, etc.....	166, 282. 50	145, 624. 71	20, 657. 79
Loss, clerical errors, pilfering, etc.....	63, 544. 59	21, 341. 68	42, 202. 91
Total.....	229, 827. 09	166, 966. 39	62, 860. 70
Grand total.....	12, 771, 279. 49	11, 540, 041. 08	1, 231, 238. 41

¹ Increase.

The gross revenue from sales represents c. i. f. cost of articles sold (\$8,753,161.20), plus surcharge (\$1,471,557.75), plus cost of manufacturing (\$1,106,656.57), a total of \$11,331,375.52.

The severest test to which the system was put during the year was at the time of the visits of the Atlantic and Pacific Fleets of the Navy in January and February. In one week in February 158 carloads of supplies were shipped to the fleets at Balboa. The total value of sales was \$176,201.57.

The commissary investment proper (exclusive of plantations, cattle industry, dairy and hog industries) amounts to \$5,950,514.71, as follows: Commissary plants and stores, \$2,913,605.61; equipment, \$131,732.17; supplies on hand, \$1,981,593.87; floating capital, approximately \$850,000; and uncompleted improvements, \$73,583.06. The amount of accrued depreciation set up is \$334,423.47, and the total profits from August, 1905, to June 30, 1921, amount to \$1,497,637.86. The loss this year amounted to 3.6 per cent on the investment.

Meat industry.—The policy was continued of fattening cattle in the pastures on the Canal Zone during the wet season, when grazing is best, and killing them during the dry months. In all, there were handled in the pastures 38,448 head of cattle with only 768 deaths. Anthrax caused 326 deaths, and 175 other deaths were probably from this cause. The area in pastures is about 44,000 acres. No new areas were cleared during the year, but 21,553 acres were recleared.

The importation of beef cattle from Colombia was discontinued during the month of February this year. Up to that time there had

been 15,833 head of fat and 222 head of lean cattle purchased at a cost of \$902,257.39 f. o. b. Colombia, an average per head for fat cattle of \$56.27 and \$50.90 per head for lean cattle. The purchasing expenses amounted to \$4,213.45 and the cost of transportation and pasturing during the year was \$447,787.30. The loss of \$93,664.08 in cattle steamer operations and the amortization of improvements to pasture lands, amounting to \$135,770.86, were written off against cattle profit for the year.

The cost of operating cattle steamers, including refitting and maintenance expenses, amounted to \$289,353.85 as compared with \$706,826.07 for the previous year.

There were 13,587 head sold and turned over to the commissary department, for which the cattle industry received a credit of \$1,-221,229.54, resulting in a gross profit for the year of \$234,458.76; deducted from this was \$229,434.94 from steamer operating loss and amortization of pastures, leaving a net profit of \$5,032.82, as compared with a loss of \$189,973.09 for the previous year. On June 30, 1921, there remained on hand 15,506 head, valued at \$1,172,086.60.

During the month of May the operations of the steamship *Caribbean* were extended to include the service previously furnished by regular Panama Railroad steamers to East Colombian ports.

Following is the present investment in the beef cattle industry: Steamship *Caribbean*, including equipment, \$167,255.73; the value of 43,960 acres of pasture lands, including buildings, fences, etc., \$903,606.85; equipment, \$12,312.49; other material, \$2,632.45. The value of cattle on hand June 30, 1921, was \$1,172,086.60.

There were killed at the abattoir 13,659 head of beef, 4,929 hogs, 2,168 poultry. The dressed beef produced was 5,499,682 pounds; dressed pork, 492,285 pounds. The value of the abattoir output was \$1,005,060.81. Cancellations of contracts for supplying beef to the Army in the United States and Porto Rico, and decreased consumption on the Isthmus due to reduction in force, caused a falling off in this business. The production of beef is an index, and it is therefore shown for the past five fiscal years:

	Pounds.
1917.....	7, 118, 803
1918.....	10, 788, 446
1919.....	15, 974, 950
1920.....	11, 335, 120
1921.....	5, 499, 682

Other products of the meat industry were sausage, bacon, ham, corned beef, tongue, smoked beef, etc., valued at \$291,669.26. Sales of hides amounted to \$75,185.94, and of other by-products to \$41,-543.37.

Plantations.—The contract system of running the plantations was continued with success, and three new contracts were entered into,

making nine plantations now under contract. Frijoles avocado (alligator pear) orchard continued in excellent condition. A record crop was harvested at Juan Mina citrus grove, and 2,600 additional trees were planted at Summit. Over 1,000,000 pounds of fruit and vegetables were supplied by the plantations, and the same amount by the gardens which Chinese are operating under contract with the commissary. These supplies, together with others purchased in the Colon and Panama markets have so increased that we discontinued purchases in Costa Rica toward the end of the fiscal year. The expense of starting the plantations and gardens was met by profits from the commissary business and that business is now receiving the benefits.

Other factors in commissary business.—Among the many hundreds of purchases made during the year were the following:

Butter.....pounds..	535, 523	Apples.....pounds..	968, 132
Eggs.....dozen..	653, 244	Coffee.....do....	308, 627
Flour.....pounds..	4, 869, 326	Fish, canned.....do....	151, 043
Milk:		Rice.....do....	1, 191, 970
Tins.....do....	1, 956, 485	Sugar.....do....	2, 709, 304
Fresh.....gallons..	146, 032	Cabbage.....do....	1, 421, 111
Tomatoes.....pounds..	188, 844	Potatoes.....do....	6, 860, 546
Onions.....do....	1, 057, 291		

The bakery made 4,140,035 loaves of bread, 44,710 pounds of soda biscuits, 35,066 pies, 9,634 dozen doughnuts, 166,866 pounds of cake, 283,345 rolls; a total value of \$463,015.91. The ice plant made 53,705 tons of ice, value \$375,475.74. The laundries handled 8,746,-622 pieces, revenue \$376,294.99. The milk-bottling and ice cream plant did a business of \$353,794.12. The dairy farm produced 69,597 gallons of milk and 5,020 gallons of cream, and its profit for the year was \$5,418.26. The poultry farm at Summit has not been successful; losses incurred are charged against profits in other parts of the system, and the poultry business has been discontinued. Business in the tailor shops has fallen so low that one shop has been closed and the other will be closed soon.

HOTELS AND RESTAURANTS.

The hotel and restaurant business included the operation of the Hotel Washington at Colon and Hotel Tivoli at Ancon, both of which are maintained for convenience of visitors at the canal; restaurants for American employees were operated at ten different places and messes for laborers at three places. The finances of this branch are summarized as follows:

	Expendi- tures.	Revenue.	Profit (+) or loss (-).
Hotel Washington ¹	\$217,027.81	\$231,805.89	+\$14,778.08
Hotel Tivoli ¹	222,207.41	231,096.73	+ 8,889.32
Hotel Aspinwall, Taboga ²	82,987.48	68,873.36	- 14,114.12
Restaurants, Americans ³	780,672.14	701,794.48	- 78,877.66
Messes, laborers ³	101,256.79	88,772.00	- 12,484.79

¹ Depreciation charges are made on these hotels.

² Discontinued July 5, 1921.

³ No charge is made for building maintenance, fuel, or lights.

In the above statement no interest charge on capital investment is made in any case. In the case of the restaurants run for the benefit of American employees, the maintenance, fuel, and light bills are charged against the general appropriation for quarters, because no charge is made for these items in the case of employees who are occupying family quarters. If the recommendation made by me that rent be charged for quarters for American employees is approved, the restaurants will be charged for repairs, fuel, and lights, and these additional charges will be reflected in the service charges.

The Hotel Aspinwall, which is the old French sanitarium, at Taboga, was operated during the year with the idea that employees would benefit by occasional trips to the island for themselves and families. Inasmuch as it was run at a loss it has been discontinued.

In the laborers' messes during the year a change was made from the system of serving meals to the cafeteria plan, because the patrons of the messes had shown a unanimous preference for the cafeteria system.

BUILDING AND OTHER CONSTRUCTION WORK.

The majority of the building forces of The Panama Canal worked during the year on construction jobs for the Army and Navy and for various companies that operate in connection with the canal. The building work done for the canal is referred to elsewhere. It consisted principally of construction of 49 buildings for silver-roll employees, construction of two concrete tanks for fuel oil, and building of stables at Colon for the Panama Railroad. Work referred to in this place is that for which the canal was reimbursed on the basis of cost for Army and Navy, and for outsiders on the "cost-plus" basis. On account of continually rising costs of materials and of labor, the cost of most of this work exceeded estimates.

United States Army.—The barracks and quarters for accommodating one infantry regiment at Fort Clayton on the Pacific side and one at Fort Davis on the Atlantic side, jobs involving an expenditure of \$3,962,849, were completed during the year, so far as funds available would permit. Certain finishing work was left undone, but the posts were brought to the point where occupancy was practicable, and they have been occupied. Construction of quarters for

the commanding officer at each post and of certain quarters for servants was deferred on account of a legal limitation as to cost in the former case and on account of lack of funds in the latter case. The water, sewer, and drainage systems at Fort Clayton and Fort Davis and necessary grading and similar work were completed. Under a special appropriation of \$40,000, construction of an ordnance machine shop and a signal storehouse at Fort Randolph and a fire-engine house at Fort Amador was begun and carried practically to completion before the end of the year. A small locomotive shed and storehouse and a landing for small boats were constructed at Fort Sherman. Grading and making of a fill for the aeroplane landing at France Field were almost completed at the close of the year. Other grading, road, and similar work was done for the Army at various points.

Work of a similar nature done for the Navy Department consisted of a prison at the submarine base at Coco Solo, a cottage at the Colon radio station, a boathouse at Darien radio station, and miscellaneous work.

Community house at Balboa.—Work was begun in March, 1920, and the building was opened to occupancy in November, 1920. It is a 2-story concrete structure, 50 by 100 feet, with space on the ground floor for lounge, writing tables, game and class rooms, restaurant and secretary's office. On the second floor are an entertainment hall, motion-picture booth, and quarters for the staff. The work was done by contract with the National Catholic Welfare Council, which is conducting the community house. The cost was \$92,583.62.

Royal Mail Building.—Construction of this building was begun in February, 1920, and, with the exception of a small amount of marble installation, was completed in June, 1921. The building is situated at Cristobal in the reservation for offices of steamship companies. It is of reinforced concrete and three stories high. The offices are on the ground floor and they are finished in marble, mahogany, and bronze; the second floor contains offices, and the third floor contains an apartment for the manager, and both these floors are finished in tile and mahogany. The cost of this building up to the end of the fiscal year was \$356,003.59.

Cable company.—Construction of a 2-story concrete building for the office of the All America Cables, at Balboa, was begun in September, 1920, and was practically completed in June, 1921. On the ground floor are the operating rooms and on the second floor are quarters for the manager and staff. The cost of this building to June 30 was \$91,885.77.

PRINTING.

The product of the printing plant and the stationery store, which is run in connection with it, is valued at \$400,377.51, which includes the manufacture of 832,000 commissary coupon books of various denominations, with an exchange value of \$7,000,000. The printing of these books on the Isthmus has continued to be an economy as well as a great convenience, and in the past year a saving of \$19,650.88 over the cost of these books in the United States was effected by printing them at our own plant. This plant is run for the convenience of the work and, as nearly as possible, it does work at cost. Report is made each quarter to the Joint Committee on Printing, and all of the plans of that committee to promote economy in public printing are being followed here.

RAILROAD.

The railroad business proper was less than in 15 years, due to the general depression in commerce and to the fact that certain construction work on the Isthmus which had required extra trains was completed. The low point was reached in December, and there was no marked improvement until May, when an increase in the amount of freight handled between terminals became noticeable. Part of this increase is due to the fact that the railroad, which ceased to be a cocarrier on August 14, 1914, entered the transshipment business again on June 10, 1921. The policy of refusing to transship cargo from terminal to terminal, except in unusual cases, was based on the desire to divert all traffic possible to the canal. It has been found in several cases, however, that this exposed cargo to considerable delay, because of the unwillingness of vessels transiting the canal to lift this cargo for the transfer only. The object of reentering the cocarrier business is not to increase the freight traffic on the railroad but to facilitate the transfer of cargo at the Isthmus.

The railroad maintained 233.46 miles of track, of which 127.52 was in main line and sidings; 60.31 in Panama Canal tracks; and 15.63 in tracks of the United States Army. The pontoon bridge across the canal at Paraiso, which was opened for traffic on May 15, 1914, had deteriorated to such an extent that it was no longer safe for trains and it was, therefore, put out of commission January 1, 1921, and later was demolished. A new station was erected at Fort Davis, between Gatun and Colon, at a cost of \$33,100. The bridge which carried the traffic of Central Avenue, in Panama City, across the tracks was torn down and a grade crossing was substituted.

The total freight carried both ways was 321,031 tons of 2,000 pounds or of 40 cubic feet, as compared with 544,244 tons in the previous year; and the average revenue per ton was \$3.24, as com-

pared with \$1.84 in the previous year. Revenue freight amounted to 316,236 tons, a decrease of 185,082 tons as compared with 1920. Local commercial freight decreased 25,000 tons; Panama Canal freight, 173,000 tons; and transit freight increased 10,000 tons, and Army and Navy freight 5,000 tons.

The following statement shows the number of passengers carried and the passenger revenue for the fiscal year 1921, as compared with the year ended June 30, 1920:

Classification.	Number of passengers carried.		Passenger revenue.	
	1921	1920	1921	1920
First-class passengers.....	469,033	503,266	\$382,012.33	\$463,674.79
Second-class passengers.....	775,802	903,984	301,451.33	256,940.66
Total.....	1,244,835	1,407,250	683,463.66	720,615.45

The average revenue per passenger per mile for 1921 was \$0.0329 and for 1920, \$0.0274. The gross revenue from transportation of passengers shows a decrease of \$37,152.79 and the number of passengers carried shows a decrease of 162,415.

The following table contains a summary of the operating statistics of the railroad for the fiscal years 1921 and 1920:

	1921	1920
Average miles operated.....	51.45	55.30
Gross operating revenue.....	\$2,242,021.69	\$2,284,745.78
Operating expenses.....	\$2,398,734.92	\$2,263,877.01
Net operating revenue.....	¹ \$156,713.23	\$20,868.77
Per cent of expenses to revenue.....	106.99	99.04
Gross revenue per mile of road.....	\$43,576.71	\$41,315.65
Operating expenses per mile of road.....	\$46,622.64	\$40,938.28
Net revenue per mile of road.....	¹ \$3,045.93	\$377.37
Revenue per passenger train-mile.....	\$4.84	\$4.58
Revenue per freight train-mile.....	\$10.03	\$7.76
Total revenue train mileage.....	\$260,428	\$299,195
Railroad revenue per train-mile.....	\$8.61	\$7.64
Railroad operating expenses per revenue train-mile.....	\$9.21	\$7.57
Net railroad revenue per revenue train-mile.....	¹ \$0.60	\$0.07
Tons per loaded car.....	10.02	12.17
Tons per train.....	129.39	127.56
Freight, passenger, and switch locomotive mileage.....	369,066	410,584
Work-train mileage.....	110,050	163,324
Passenger-train mileage.....	158,188	180,177
Freight-train mileage.....	102,240	119,015

¹ Loss.

Panama Railroad stables at Colon.—These stables were completed during the year. They are described in the report for 1920. They provide accommodations for 432 horses and 240 vehicles, with necessary repair shops, feed rooms, latrines, compost pits, storerooms, and quarters for employees. The work was estimated at \$144,300 and was completed well within the estimate.

Railroad station at Fort Davis.—When Fort Davis, between Gatun and Cristobal, was ready for occupancy, a concrete railway station, similar to that at Corozal, was erected. In effect, this is a concrete platform over part of which is erected a roof, affording shelter for first and second class passengers. Office, baggage room, and toilet rooms occupy the center of the platform.

TELEPHONES.

The telephone system was conducted along routine lines, with a total of 2,992 telephones in use at the end of the year, a decrease of 338 since the last fiscal year. The average number of calls during the 8-hour business day was 28,809, as compared with 29,744 for the previous year. An automatic exchange, with capacity of 26 lines, 4 rural lines, and 4 trunk circuits, was installed at Gamboa. The telephone system at the end of the fiscal year included 36 miles of pole line, 249 miles of conduit, 135 miles of cable, 13,780 miles of wire, 960 miles of phantom circuits, 180 miles of simplex circuits, 28 exchanges, and 6,109 telephones.

LAND AND BUILDINGS.

The revenue credited to rentals from lands of the Panama Railroad Co. amounted to \$120,865.42. The expenses in connection with land leases were \$13,042.38, leaving a net revenue of \$107,823.04, which is \$3,634.64 increase over the previous year. Rentals from buildings not used in operation of the railroad amounted to \$19,472.44 and the expenses amounted to \$12,245.37, leaving a net revenue of \$7,227.07, as compared with \$4,093.90 last year. The capital investment in railroad real estate up to June 30, 1921, amounted to \$2,111,981.07, with no uncompleted improvements under construction.

The Panama Canal grants revocable licenses to permit companies whose business is pertinent to the operation of the canal to erect oil tanks, office buildings and similar structures, and to permit public welfare organizations to build churches, lodge halls, and clubhouses. Seventy-six such licenses, covering the use of lots in the Canal Zone are in effect. Collections from this source aggregated \$16,990.02. No rental is collected on lots occupied by churches.

CLUBHOUSES.

In Section IV is a brief reference to the clubhouses maintained as part of the system of keeping up the morale of the force. In these are sold light lunches, cigars, confections, and novelties, and charges are made for such special services as use of bowling alleys and billiard tables. These clubhouses are almost self-sustaining, if no charge be made against capital cost, and steps have been taken to place them on a basis of paying all expenses of operation and maintenance in the fiscal year 1922.

OPERATIONS WITH PANAMA RAILROAD COMPANY'S FUNDS.

A recapitulation of financial transactions on the Isthmus under this head will be found in Section V, statement No. 48.

PANAMA RAILROAD STEAMSHIP LINE.

The gross revenue of the steamship line for the fiscal year ended June 30, 1921, was \$5,156,446.84, and the operating expenses were \$5,857,257.06, leaving a net deficit of \$700,810.22. This deficit, as compared with that for the fiscal year ended June 30, 1920, of \$278,521.70, shows an increase in deficit of \$422,288.52.

Briefly, the principal causes contributing to the deficit were:

The strike of the marine engineers, which closed the line for a month.

The tonnage carried fell off 33 per cent as compared with the previous year, due to depression in business throughout the world and the stoppage of credit to South American merchants, the unfortunate situating regarding rates of exchange contributing to this depression.

The costs of all supplies and wages were maintained at high marks.

Heavy expenses incurred for repairs that under agreements in force would not be undertaken by the crews.

Operation of the steamship Caribbean.—This steamer was operated by the cattle industry of the Panama Railroad between Cartagena in Colombia and Cristobal, serving as a carrier for cattle purchased in Colombia for use on the Isthmus and as a feeder for general cargo to be picked up by the ships in the New York service. The *Caribbean* made 35 round trips between Colombia and the Canal Zone and carried 16,457 head of cattle, 3,929.79 tons of general cargo, specie valued at \$584,287.96, and 630 passengers. The revenue from all business except the cattle business was \$42,337.92, divided as follows: General cargo, \$18,624.63; specie, \$1,475.36; mail, \$94.43; passengers, \$12,143.50.

SECTION III.

GOVERNMENT.

The usual functions of government are carried out in the Canal Zone through the health, municipal, and executive departments, but in addition all of the accounting work is done in the accounting department, while aids to navigation, steamboat inspection, and hydrographic and meteorologic work, commonly considered government duties, are here associated with canal operation. The cost of government is merged with that of administration, and as close a division as can be made is found in the statement of working force by canal operation, business operation, and Government in Section IV of this report. From the general financial statements may be obtained the data of cost and revenue of various branches.

POPULATION.

A census of the Canal Zone was made by the police force during the month of June, and a summary of its result follows:

	Americans.					All others.					Total.
	Total men.	Em- ploy- ees.	Total wo- men.	Em- ploy- ees.	Chil- dren.	Total men.	Em- ploy- ees.	Total wo- men.	Em- ploy- ees.	Chil- dren.	
Balboa district.....	2,022	1,851	2,065	279	2,048	3,105	2,227	2,071	44	3,169	18,881
Cristobal district.....	768	748	607	44	613	3,036	2,866	1,480	22	2,608	12,792
Prisoners.....	35	.....	.....	.....	.....	128	9	2	.....	.....	174
Total employees.....	.....	2,599	.....	323	.....	.....	5,102	.....	66	.....	18,090
Total persons.....	2,825	.....	2,672	.....	2,661	6,269	.....	3,553	.....	5,777	23,757

¹ Includes 256 civilian employees of United States Army.

PUBLIC HEALTH.

Health work has in view lessening of the tropical hazard, which can be reduced but not eliminated; lessening of disease hazard by strict cleanliness and antimosquito and antirodent work; curative work in public dispensaries and hospitals; and quarantine at canal ports. The jurisdiction of the chief health officer extends to the cities of Panama and Colon, in addition to the Canal Zone. In the two cities, however, there are physicians in private practice and a private hospital in each, and the chief health officer's jurisdiction in them is comparable to that of a municipal health officer in the United States. In the Canal Zone there are no private practitioners

or hospitals, and the health department is in direct charge of all health work. This work was carried on during the year without marked change from past years, except in the improvements that are the result of experience.

Canal Zone.—The population (civil and military) at the beginning of the fiscal year (July, 1920) was 29,323, and this has been used as the base for vital statistics.

From this population 233 deaths occurred during the year, 206 of which were from disease, giving a rate of 7.03 for disease alone, as compared with 7.08 for 1920.

The death rate from tuberculosis was 0.78, as compared with 0.81 for the year 1920. Deaths from tuberculosis this year were 10 per cent of all deaths.

The birth rate for the year was 23.84. The infant mortality rate, based on the number of births reported for the year, was 41.24 for white and 132.36 for black children, with a general average of 94.42. Of the total births reported, 5 per cent were stillbirths. Of the total deaths reported, 39 per cent occurred among children under 5 years of age. The maternal mortality rate (from conditions due to the puerperal state) was 9.51 per 1,000 births, stillbirths included.

Panama.—The average population of the city for the year was 60,500, as compared with 61,369 for the last year. From this population 1,245 deaths occurred during the year, of which 1,181 were from disease, giving a rate of 19.52 for disease alone, as compared with 20.11 for the preceding year. Tuberculosis gave a death rate of 3.26, as compared with 3.80 for 1920 and 4.30 for 1919; this was 16 per cent of the total deaths, as compared with 18 per cent for last year.

The principal causes of death, compared with last year, were as follows:

	1919-20	1920-21
Tuberculosis (various organs)	233	197
Diarrhea and enteritis	159	178
Pneumonia (broncho and lobar)	193	162

There were 2,257 live births reported for the year, giving a rate of 37.30. The infant mortality rate, based on the above number of births was 157.28. Of the total number of births reported, 6 per cent were stillbirths. Of the total deaths reported 42 per cent occurred among children under 5 years of age. The maternal mortality rate (from conditions due to the puerperal state) was 5.85 per 1,000 births, stillbirths included.

Colon.—The average population of the city for the year was 26,078, a new census not having been taken. From this population, 521 deaths occurred during the year, of which 491 were from disease, giving a rate of 18.63 for disease alone, as compared with 20.21 for the preceding year.

The principal causes of death, as compared with last year, were:

	1919-20	1920-21
Tuberculosis (various organs).....	101	91
Nephritis (acute and chronic).....	56	42
Pneumonia (broncho and lobar).....	47	36

There were 939 live births reported for the year, giving a rate of 36.01. The infant mortality rate, based on the number of births, was 143.66. Of the total births reported, 5 per cent were stillbirths. Of the total deaths, 37 per cent occurred among children under 5 years of age. The maternal mortality rate (from conditions due to the puerpural state) was 12.70 per 1,000 births, stillbirths included.

Hospitals.—All hospitals are under the health department of The Panama Canal, but report is made here only on those directly administered by the canal. The Panama City Hospital (Santo Tomas) and two private hospitals (one each in Panama and Colon) are not included.

Patients treated at Panama Canal hospitals, fiscal year 1921.

Location.	July 1, 1920.		Admitted.		Died.		Discharged.		Transferred.		Remaining June 30, 1921.	
	White.	Negro.	White.	Negro.	White.	Negro.	White.	Negro.	White.	Negro.	White.	Negro.
Ancon.....	169	232	4,977	4,428	53	176	4,882	4,207	45	108	166	169
Colon.....	26	35	1,257	1,539	27	92	961	863	271	601	24	18
Corozal, insane.....	81	263	87	135	7	26	63	77	2	11	96	284
Corozal, farm, cripples..	4	27	18	52	.....	2	17	37	1	14	4	26
Corozal, chronic.....	.....	26	1	10	.....	4	.....	3	.....	4	1	25
Palo Seco, leper.....	5	69	1	9	1	3	2	4	.....	.....	3	71
Total.....	285	652	6,341	6,173	88	303	5,925	5,191	319	738	294	593

In the surgical clinic at Ancon Hospital 1,600 major operations and 4,952 minor operations were performed and 301 obstetrical cases were delivered. In the eye and ear clinic 1,294 refractions were done and 1,459 operations performed, in addition to which 7,970 cases not in the hospital were treated. In the X-ray clinic 2,653 cases were handled, 5,886 plates and 57 films were made, and 1,495 dental films were made. In the medical clinic, in addition to the hospital work, 1,370 cases not in the hospital were treated; 199 cases

of smallpox were treated, from which there was 1 death; 2,191 adults and 354 school children were vaccinated.

Quarantine.—The basic policy on which the quarantine of The Panama Canal has been operated during the fiscal year has been to facilitate to the utmost the movement of ships consistent with the safeguarding of the health of the Canal Zone and the personnel of arriving vessels. To this end the detention of passengers and ships has been reduced to the lowest margin of safety; vessels have been boarded from speed launches; passengers have been inspected while the ship was under way; the hours of boarding have been lengthened to 10 p. m., so that ships arriving after sundown would be ready to begin their transit of the canal at sunrise; shipmasters have been encouraged to have the passengers and crew mustered and ready for inspection as soon as the vessel arrived at the quarantine area; the number of places quarantined against has been reduced to those known to be infected with quarantinable disease; a system of granting pratique by wireless to naval ships has been instituted; and the principle has been followed that as a rule disease is carried by the living things aboard arriving craft rather than by the inanimate vessel itself.

The extent to which this principle has been carried into practice is evidenced by the fact that at Cristobal during the year three ships were detained a total of three days, as against six ships for a total of seven days in the fiscal year 1920. At Balboa the results were even more striking, 19 ships being held a total of 66½ days, as against 91 ships for 198 days in the previous fiscal year. These reductions in delays to commercial ships and passengers translate themselves into financial savings of considerable magnitude.

While there has been a marked reduction in the average length of delay to ships, there has been a coincident increase in the total operations. In spite of the falling off in shipping because of marine labor troubles, the quarantine officers at the terminal ports inspected 4,153 vessels in the fiscal year just ended as against 3,440 in the previous fiscal year, an increase of over 20 per cent. In the same period the total number of persons inspected on arrival increased from 324,263 in the fiscal year 1920 to 403,823 in the fiscal year ended June 30, 1921, an increase of 24.5 per cent.

The presence of alastrim in Caribbean ports and the outbreaks of true smallpox in Cuba and Hayti were a menace, but there was no infection from these sources. Smallpox on the United States battleship *Mississippi*, probably contracted in California, resulted in 28 cases, but no fatalities. Yellow fever has not been a menace, and it is believed that the present efforts in Yucatan and Peru to eradicate this disease will result in its complete disappearance from the Western

Hemisphere. Meanwhile, necessary precautions against infection in the Canal Zone are kept up, both by strict quarantine and by keeping down the number of *stegomyia* mosquitoes. Typhus was reported from Mexico and Bolivia, but no case was found at canal ports. No case of bubonic plague was handled at canal ports, but this disease is an ever-present menace and precautions are taken against its gaining a foothold here. The danger lies in the infection of rats in the ports and the subsequent spread of the disease to jungle rats and other wild rodents. In this way an enzootic residual focus would be created, the eradication of which would be well-nigh impossible. In order to forestall any such contingency, all vessels in canal ports are required to breast off and otherwise rat guard, and ships from infected ports are fumigated for the destruction of rats and other vermin. In addition a circular is given to the master of each arriving vessel, urging upon him the necessity for maintaining antirodent precautions in all ports and advising the frequent fumigation of his vessel, no matter whether it has touched at known infected ports or not. The results of the periodic fumigation of ships have been most gratifying. Frequently vessels on their first fumigation are found to have harbored large numbers of rats, but on subsequent fumigations are found practically rodent free.

MUNICIPAL ENGINEERING.

The work of maintaining a water supply, highways, walks, and sewers in the Canal Zone and the cities of Panama and Colon was continued along routine lines.

Water.—The supplying of pure water, an essential to good health in the tropics, was continued from three sources: Brazos Brook Reservoir for Cristobal, Colon, and Army and Navy garrisons to the east of Colon; Agua Clara Reservoir for Gatun and Fort Sherman; and by pumping from the Chagres River for the southern section of the Isthmus. The system comprises the two reservoirs mentioned, 10 pumping stations, 3 purification plants, 131.8 miles of mains, and 54.6 miles of branch mains. The cost of delivering water (not including capital cost) was from 4 to 13 cents a thousand gallons, the greater part costing from 7 to 8 cents a thousand gallons. The water is continually under test by physiologists, and each of the three purification plants is in charge of a chemist. The consumption was as follows:

	Gallons.
Canal Zone.....	7, 582, 672, 652
Panama.....	1, 080, 412, 000
Colon.....	708, 429, 750
Vessels at canal ports.....	165, 688, 188

The collections from Colon were \$148,554.15; from Panama, \$176,736.95; sales to steamships, other departments of the Government, Panama Railroad, and all except Panama Canal, \$261,575.20.

Highways.—The roads and streets in the terminal cities and the Canal Zone, a total of 1,183,842 square yards, were swept and maintained, including renewals of wearing surfaces, cutting grass along the roads, and the clearing of ditches and drains.

Sewers.—The sewers in the Canal Zone and the terminal cities were flushed weekly and otherwise maintained. Work was continued on the construction of a new sewer in the city of Panama parallel to the east water front. It consists of a reinforced concrete box with necessary laterals.

Garbage disposal.—Garbage from the city of Panama and the Ancon-Balboa district was incinerated during the first half of the year, when the incinerator was closed for repairs. Since then the garbage has been buried at places where the filling will be of value. It is covered lightly with clean earth and sprinkled with disinfectant to prevent insect breeding. In August, 1920, the new incinerator at Cristobal was placed in service, and since that time all garbage from the Colon-Cristobal district has been burned.

During the first half of the year a large amount of municipal engineering construction work was done for the Army at the new posts, and this is referred to under business operations.

PUBLIC ORDER.

For purposes of public order the Canal Zone may be likened to a great port because of the cosmopolitan nature of the floating population and the character of the cases that it is necessary to handle. So far as the canal villages themselves are concerned, little policing is necessary, and this is usually of a routine character. The police force at the end of the year numbered 178, of whom colored policemen numbered 44. This compares with a force of 183 on July 1, 1920. The force at the penitentiary consists of 19 men; on duty with the Panama Railroad, 27 men; on duty at the locks, 9 men; acting as boarding officers, 2 men; in launch service, 8; guards on road work, 4; on detective service, 6; on regular police duty, 91.

The arrests made were 4,941, of whom 261 were females. Arrests were made on warrant in 566 cases. Of the total cases, 1,057 were disposed of without action by the court. In the courts 3,210 were convicted, 622 dismissed, and 52 were unsettled at the end of the year. The largest number of arrests was made under the general classification of disorderly conduct, 793; violation of motor vehicle regulations, 659; violation of national prohibition act, 267; petit larceny, 262; loitering, 312; alien enemies detained in transit across the Canal Zone, 331; assault and battery, 132; held for naval authorities, 147; held

for military authorities, 59; grand larceny, 121; gambling, 82; fighting, 58. The people arrested represented 44 distinct nationalities. British subjects arrested numbered 1,692, which includes representatives of the West Indies 1,455, and of the balance of the empire 237. (In the list of nationalities represented the British Empire is considered as one.) American citizens numbered 1,348; Panaman citizens, 590; citizens of Germany (alien enemies), 321; Colombia, 225. By occupation, the largest number of arrests was that of chauffeurs, 900; laborers, 786; sailors and seamen, 546; soldiers, 448; firemen, 312; no occupation, 603.

Seven cases of homicide were handled. Three West Indian Negroes held over from the previous year were hanged for murder on December 1, 1920.

An average of 117 prisoners a month served sentences in the common jails, and all physically able to work were employed on road and clearing work or at the police and fire stations. The labor performed by these prisoners, on the basis of rates for common labor, was valued at \$36,501.69.

Eight arrests were made in the opium traffic and this traffic was practically suppressed.

Deportations were made of 45 persons, of whom 38 were convicts who had completed terms of imprisonment, and 7 were persons who had been convicted of misdemeanor charges or were deemed undesirable inhabitants of the Canal Zone.

At the penitentiary at Gamboa 91 new convicts were entered, 51 completed terms and were discharged, and 3 were executed. Most of the convicts were employed on the construction of the Paraiso-Gamboa road and on other municipal work. A few were employed on the penitentiary farm and in the maintenance of prison buildings and grounds. On the farm a considerable quantity of produce was raised, and this was used in supplementing the regular food ration. On the basis of standard rates of pay, the value of work performed by the convicts was \$22,827.19. The total cost of subsisting, guarding, and clothing convicts was \$34,837.45, of which \$16,355.07 was paid out as salary of officers and guards at the penitentiary, and \$8,909.44 for salaries of officers and guards on road work. The total amount expended for subsistence of convicts was only \$6,714.59, and this small expenditure was due to the fact that the convicts themselves raised a considerable amount of the food they ate.

OFFICE OF DISTRICT ATTORNEY.

The office of the district attorney handled 500 criminal cases before the district court, in which a verdict of guilty was rendered in 359 cases; of not guilty in 35; 35 were dismissed and 80 were otherwise disposed of. In the 80 "otherwise disposed of" the majority were

found guilty on other charges. Of the 500 cases, 97 were on appeal from the magistrates' courts, in which 65 were found guilty, 8 not guilty, and 8 were dismissed by the court. Of the criminal cases pending at the beginning of the fiscal year, all were disposed of except two charges against a bank manager, arising out of the failure of the Continental Banking & Trust Co. of Panama, warrants for extradition of whom are still in the hands of the Department of Justice. At the close of the fiscal year 42 other cases were pending, this large number being accounted for by the fact that there were no sittings of the court during the month of June. Civil cases in which the district attorney represented The Panama Canal numbered 17. Details of these cases will be found in the report of the district attorney.

THE COURTS.

The courts utilized the organization of The Panama Canal for administrative purposes during the year, but except for this they are not under the jurisdiction of the executive power on the Canal Zone.

DISTRICT COURT.

The district court held sessions at Ancon and Cristobal and transacted the following business:

Cases pending first of fiscal year: Civil, 126; probate, 130; criminal, 26; total, 282. Cases filed during fiscal year: Civil, 145; probate, 263; criminal, 397; total, 805. Cases settled during fiscal year: Civil, decided, 92; transferred, 6; dismissed, 72; total, 170; probate, 243; criminal, acquitted, 26; transferred, 3; convicted, 280; dismissed, 28; nolle prosequi, 32; total, 379; grand total, 792. Cases pending last of fiscal year: Civil, 101 (forfeits and dismissed, 10); probate, 150; criminal, 44; total, 295. Number of sessions of court, 168; number of marriage licenses issued, 865; number of deeds recorded, 10; collections, \$503.42. Items bearing upon the work of the courts will be found, also, in the annual report of the district attorney and the chief of police and fire division.

The district judge, John W. Hanan, resigned toward the end of the fiscal year, and Judge Charles Kerr of Kentucky was appointed to succeed him. Judge Kerr assumed the duties of the office on July 16, 1921.

MARSHAL.

Writs of process received, 392; served, 341; not served, parties not found, 51; fees collected, \$1,161.62; paid witnesses, \$100; paid jurors, \$50; paid interpreters, \$20; trust funds received, \$131,123.60; disbursed, \$131,123.60; attendance at court, 119 days at Ancon, 49 days at Cristobal.

MAGISTRATES COURTS.

Balboa.—Cases pending first of year: Civil, 1; criminal, 4; total, 5. Cases docketed during year: Civil, 71; criminal, 2,175; total, 2,246. Cases disposed of during year: Civil, 70 (appeals 14); criminal, 2,178; acquitted, 130; convicted, 1,664 (appeals, 70); dismissed, 197; held to district court, 187; total, 2,248. Cases pending at end of year: Civil, 2; criminal, 1; total, 3. Total collections, \$13,941.53. During the year, and as provided for in executive order of May 10, 1911, petitions were made to the district judge for the commitment of 85 persons (of whom 26 were soldiers) to the Insane Asylum for observation, as follows: Whites, male, 41; female, 4; total, 45; negroes, male, 25; female, 15; total, 40.

Cristobal.—Cases pending first of year: Civil, 2; criminal, 7; total, 9. Cases docketed during year: Civil, 32; criminal, 2,005; total, 2,037. All cases were settled, except one criminal case pending on July 1, 1921. Of the total criminal cases settled there were 1,430 convictions, 331 acquittals, 46 dismissals, and 205 committed to the district court. Total collections, \$14,834.20.

FIRE PREVENTION.

Fire stations were maintained at eight places and also fire equipment on four tugs. The paid fire force numbered 44 men, of whom 17 were stationed at Balboa, 4 at Pedro Miguel, 19 at Cristobal, and 3 at Gatun. One hundred and sixty-eight volunteer firemen served in six stations other than those at which paid forces were maintained. The crews of the four tugs mentioned acted, also, as volunteer firemen. The total force consists of 212 men. Fires numbered 103 and there were 13 false alarms. Fires in ships numbered 13, and the largest single loss was in a ship in the harbor at Balboa, amounting to \$90,000. The total fire loss was \$115,735.22. It is estimated that the property endangered by fires during the year had a value of \$10,500,000.

SCHOOL SYSTEM.

During the past school year, October 1, 1920, to June 30, 1921, five elementary and two high schools for white American children and seven elementary schools for colored West Indian children were maintained. The school organization is comparable with a city school system in continental United States, with a superintendent and his assistants in charge and a principal at each school; the towns of the Canal Zone, although more scattered, being comparable with the sections of a city where schools are located. All elementary schools are graded and the high schools offer the usual courses. There are frequent pupil transfers to and from the States, and the high school graduates enter the various institutions of higher learning.

A high-grade teaching personnel is maintained. The teaching corps in the white schools is composed of well-qualified and experienced American teachers appointed from the States. The teachers in the colored schools are men from the West Indies, trained and experienced in teaching in their homeland.

The net enrollment was 2,082 and 1,454, and the average daily attendance 1,633.2 and 1012.9, in the white and colored schools, respectively. There was a teaching force of 85 white and 24 colored employees. The average number of pupils per classroom teacher was about 30 and 50 in the white and colored schools, respectively. The number of colored teachers is inadequate for conducting the colored schools satisfactorily.

Two teachers are assigned to substitute for teachers absent on account of sickness, and to assist individual pupils in the elementary white schools. Besides the absences covered by these two teachers and by per diem substitutes, rooms were dismissed 160 days. Two teachers are inadequate for this work.

A plan of promotion by subjects in grades four to eight, inclusive, has been successfully operated for the past three years. A general uniform program is followed in these grades and the pupils pass to other rooms for their irregular subjects. Supervisors and special teachers follow a floating program. The plan has worked to the advantage of all concerned.

Music and penmanship instruction has been conducted under special supervisors. Besides the high-school modern language courses, Spanish instruction has been given in grades four to eight, inclusive, by special Spanish-speaking teachers.

A unique problem in school administration and supervision exists here because the teachers come from so many different States and localities, bringing with them their various local views, standards, and methods of teaching; because the annual turnover in teaching force is large; and because of frequent transferring of pupils to and from the States. The past year 42.8 per cent of the white teachers were new. The corps of white teachers represented 27 States and two foreign countries, and practically as many localities and different school systems as there were teachers. The length of service for teachers in the Canal Zone schools averaged about three years. The average length of time for pupils is about the same.

The school buildings are modern and well equipped. Some annex buildings have been provided to accommodate the overflow from main buildings. It is necessary to accommodate the two high schools in buildings with the grades, until new modern high school buildings can be provided. Classroom accommodations in the colored schools are inadequate. A double-shift plan, whereby two classes alternate in using the same classroom, has been operated in some of the colored schools.

While the Canal Zone school system is first class, there are still needs to be met and improvements to be made, but which I have regretfully omitted from our estimates in the interest of economy. The Canal Zone schools not only provide educational facilities for the children of the American communities of Panama Canal employees, but also serve as an example of American education to many non-Americans visiting The Panama Canal. The best possible educational system is required, in the former case, since the very existence and future of our form of government is dependent upon public education, and desirable, in the latter case, in order to convey the proper impression to non-Americans judging American education by the Canal Zone school system. Children of Panamans and of representatives of foreign governments and business firms living in Panama and Colon attended the Canal Zone schools by payment of tuition fees aggregating about \$5,000 for the year.

POSTAL SYSTEM.

Eleven post offices were in operation at the end of the year, five having been closed because of lack of funds and for reasons of economy. Postal receipts amounted to \$161,476.13, as compared with \$138,391.60 for the previous year, an increase of 16.6 per cent, amounting to \$23,094.53. In addition to paying the Panaman Government \$39,544 for postage stamps which could have been purchased from the United States Post Office Department for \$2,000, all official mail of The Panama Canal and the Army and Navy within the Canal Zone was carried free, and transportation charges were paid on official mail to the United States. If the Canal Zone postal system had been relieved from payment of the subsidy of 40 per cent of the face value of postage stamps furnished by Panama, the revenue would have exceeded the expenditures for the fiscal year by about \$20,000; this with free handling of official mail to the amount of about 64 per cent of the whole.

The number of money orders issued was 136,976, an increase over 1920 of 13,851, the total value amounting to \$3,759,132.76, an increase of \$59,135.78. The increase in fees collected was \$1,421.55. Postal savings money orders were issued of a total value of \$1,348,245 and paid of a total value of \$1,352,425. The balance on deposit June 30, 1921, was \$660,720 as compared with \$520,070 at the close of the previous fiscal year. Depositors were paid \$7,952.18 interest on orders cashed, and interest received from banking institutions on funds on deposit amounted to \$25,803.10, leaving a net balance for the year of \$17,850.91. The postal savings money order system has been in operation since October 15, 1914, and to June 30, 1921, showed a profit of \$84,357.72. The rate of interest paid depositors is 2 per cent per annum, and recommendation has been made for

legislation that will permit an increase in the interest rate to 3 per cent, which it is hoped will be approved.

The director of posts continued to act as postal agent for the United States Post Office Department under an arrangement concluded in 1916, under which arrangement all transit United States mail and foreign closed mail dispatched by way of United States ports to the west coast of Central and South America is forwarded here. On April 1, 1921, at the request of the United States Post Office Department, the handling of foreign closed transit mail, formerly handled by the British packet agent, was taken over by the director of posts.

The greatest need of the bureau of posts at present is for post-office buildings at Cristobal, Ancon, and Balboa. The buildings now in use are built of wood and have deteriorated to a point that makes the cost of upkeep high. The business has also outgrown the size of the buildings, which makes unpleasant and crowded working conditions for the employees, and also inconveniences the public. These necessary improvements have also been omitted from estimates for reasons of economy.

CUSTOMS.

Customs work increased considerably during the year. Notwithstanding the decrease in shipping during May and June, the total number of vessels entered and cleared during the fiscal year 1921 was 13,914, as compared with 12,039 during the previous year, an average increase of 156 vessels a month. For merchandise destined to the Republic of Panama entered at the ports of Cristobal and Balboa, 8,302 releases were granted. One thousand five hundred and sixteen requests for free entry under the treaty and Taft agreement were handled. Three hundred and eighty-four inspections of household goods of employees being returned to the United States were made, for which the sum of \$1,050 was collected. In addition to invoices for The Panama Canal and Panama Railroad, which are certified without charge, 1,048 invoices were certified, for which the sum of \$820.50 was received. The bureau of customs is also charged with the exclusion of Chinese from the Canal Zone, and also cooperates with the Republic of Panama in the enforcement of its Chinese exclusion law. The number of Chinese passengers arriving at ports of the Canal Zone was 1,272, as compared with 490 for the previous fiscal year, and 319 Chinese crews were also handled. Bonds for the temporary release of Chinese in transit were deposited to the amount of \$100,500. Three times as many prohibited alien passengers were handled during the year as were handled during the previous year.

SHIPPING COMMISSIONER—SEAMEN.

The shipping commissioner and his deputies have the same powers as shipping commissioners in the United States and American consuls in foreign ports with respect to American seamen. During the year 4,313 seamen were shipped and 3,462 discharged, as compared with 4,281 shipped and 3,378 discharged during the previous fiscal year. There were lodged and subsisted at the expense of the State Department 707 American seamen, of whom 382 were returned at the expense of the Government and 325 procured employment on vessels or signed on as work aways. The total amount of wages earned by seamen discharged at Canal Zone ports amounted to \$421,690.97. Deductions amounting to \$160,279.63 were approved, and \$261,411.34 were either paid to seamen or received on deposit for them. The estates of 10 deceased American seamen were handled during the year and settled with the proper courts. Two American vessels were sold under libel actions in the Canal Zone, in which cases the shipping commissioner represented the interests of the seamen.

ADMINISTRATION OF ESTATES.

Estates of 142 deceased and insane employees, amounting to \$19,968.71, were settled as compared with 258 estates during 1920, and there were 27 estates in course of settlement on June 30, 1921.

RELATIONS WITH PANAMA.

Relations of the canal administration with the Republic of Panama were carried on as usual, and, in addition to these, the Governor acted in an advisory capacity in other matters concerning the affairs of the Republic with relation to the United States. In the report of the executive secretary is a partial list of the various matters handled, consisting of 73 distinct items. Some of these were of a routine nature, but several of them were matters of considerable importance, both to the United States and to Panama. No report is made on these questions, because each of them involves diplomatic relations and only an exhaustive discussion would be fair.

THE TAFT AGREEMENT.

Attention is called to the statement showing that the postal service paid \$39,544 to the Government of Panama for stamps that would have cost \$2,000 if United States stamps were used. This subsidy is paid as part of the consideration of the *modus vivendi* of 1904-5, known as the Taft agreement. This agreement was a temporary measure for the construction period of the canal only, and since the canal was opened to commerce recommendations for re-

placing it by a formal treaty have been made. The formal opening of the canal was made on July 12, 1920, by proclamation of the President, and thus one more obstacle to a proper adjustment of diplomatic relations between the Canal Zone and the Republic of Panama was removed. It is not my purpose to discuss here a question so complicated as this, but I wish to make it of record in this report that all of the reasons advanced at any time for repeal of the Taft agreement still exist, and recommendation for its repeal is therefore renewed.

LAWS AND EXECUTIVE ORDERS.

Laws enacted and Executive orders issued during the year, applicable to The Panama Canal, form Appendix E of the report of the executive secretary. Toward the end of the year, the compilation of all laws of the Canal Zone was completed, and publication will be made within the next six months.

SECTION IV.

ADMINISTRATION.

CHANGES IN ORGANIZATION.

The following is quoted from the annual report of the executive secretary to me under date of August 15, 1921:

Chester Harding, brigadier general, retired, Engineer Corps, United States Army, ended 12 years of service on The Panama Canal March 27, 1921, when he resigned as Governor of The Panama Canal. A statement of his service with the canal follows:

“July 27, 1907, detailed from Engineer Corps, United States Army, to Isthmian Canal Commission, as division engineer, Gatun Locks.

“July 1, 1908, when canal work was reorganized and divisions consolidated, made assistant division engineer of the Atlantic division, continuing as such until he resigned, February 27, 1913.

“November 4, 1914, detailed from Engineer Corps, United States Army, to be assistant to the Governor of The Panama Canal.

“January 1, 1915, promoted to engineer of maintenance.

“January 11, 1917, took oath as Governor of The Panama Canal.

“March 27, 1921, resigned, having continued as Governor, by request of the Secretary of War, two months beyond his term.”

Speaking for the thousands of canal men who hold Gen. Harding in affectionate esteem, I wish to make this brief personal note in my report as an evidence of the regard of his fellow workers.

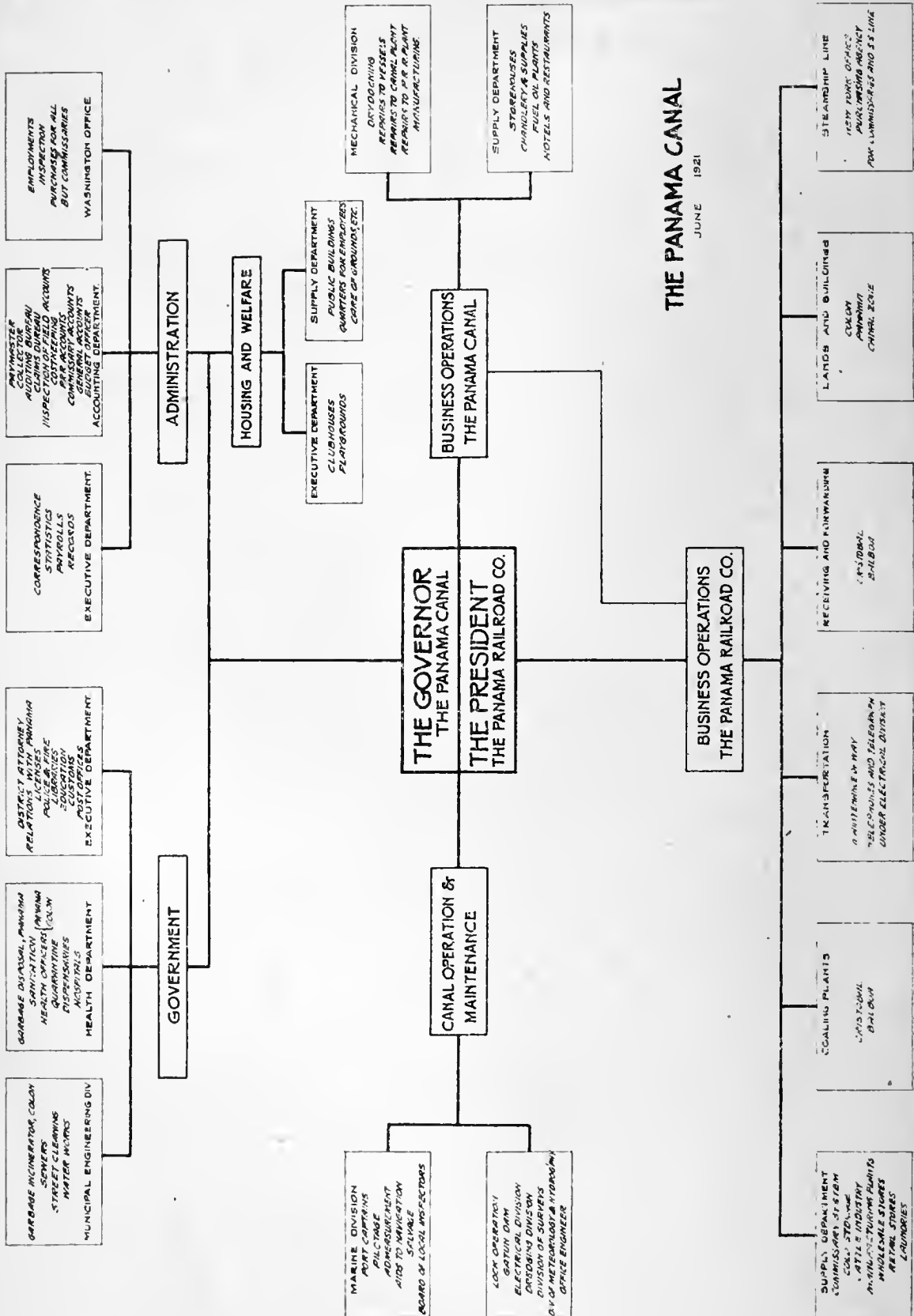
I wish to add to this brief tribute of the executive secretary my own appreciation of the high service done for our Government by Gen. Harding during his term as Governor.

Col. Jay J. Morrow, engineer of maintenance under Gov. Harding, took the oath of office as Governor, March 28, 1921.

Other changes in executives in the administration were as follows:

Judge Frank Feuille, who had been special attorney of The Panama Canal and counsel for the Panama Railroad on the Isthmus since 1910, resigned on September 20, 1920. In his capacity as special attorney, Judge Feuille had represented The Panama Canal before the joint commission, to which claims on account of land expropriated for the canal and related uses were referred. He also, through the land office, adjusted claims which were settled through his efforts without reference to the joint commission. His zeal in defending the Government against exorbitant claims resulted in a saving of so much money that it probably can be reckoned in millions of dollars—certainly in hundreds of thousands. The value of his service, like that of Gen. Harding, can not be overestimated.

In accordance with precedent, immediately after my appointment as Governor I requested the detail of an officer of the Engineer Corps, United States Army, to act as engineer of maintenance and,



in the absence of the Governor, to act in that office. Col. Meriwether L. Walker was detailed, and, on July 2, 1921, he took up the duties of the office. It has been evident for two years or more that so much detail work was coming to the Governor and to the engineer of maintenance as to hamper them in their proper duties as executives, planning for the improvement of the service and promoting economy in the handling of the work. On this account I established the office of assistant engineer of maintenance, and Maj. C. S. Ridley, Engineer Corps, United States Army, was detailed to fill it. He is representative of the Governor on the Wage and Complainants Boards, and has supervision of a portion of the engineering duties that center in the office of engineer of maintenance. He assumed office on May 10, 1921.

Mr. T. C. Morris resigned as resident engineer of the building division on July 28, 1920, and was succeeded by Mr. J. B. Fields, up to that time superintendent of construction, under whom the work then in hand was carried to completion. On June 1, 1921, the new construction work having been practically completed, the building division was abolished and such members of the force as were needed for the maintenance work on buildings of all kinds were transferred to the supply department, where they will work under the direction of Mr. Fields, who has been designated constructing quartermaster.

On June 1, 1921, the municipal engineer, Mr. D. E. Wright, resigned, and Mr. George W. Green, who had been acting during the absence of Mr. Wright, was appointed municipal engineer.

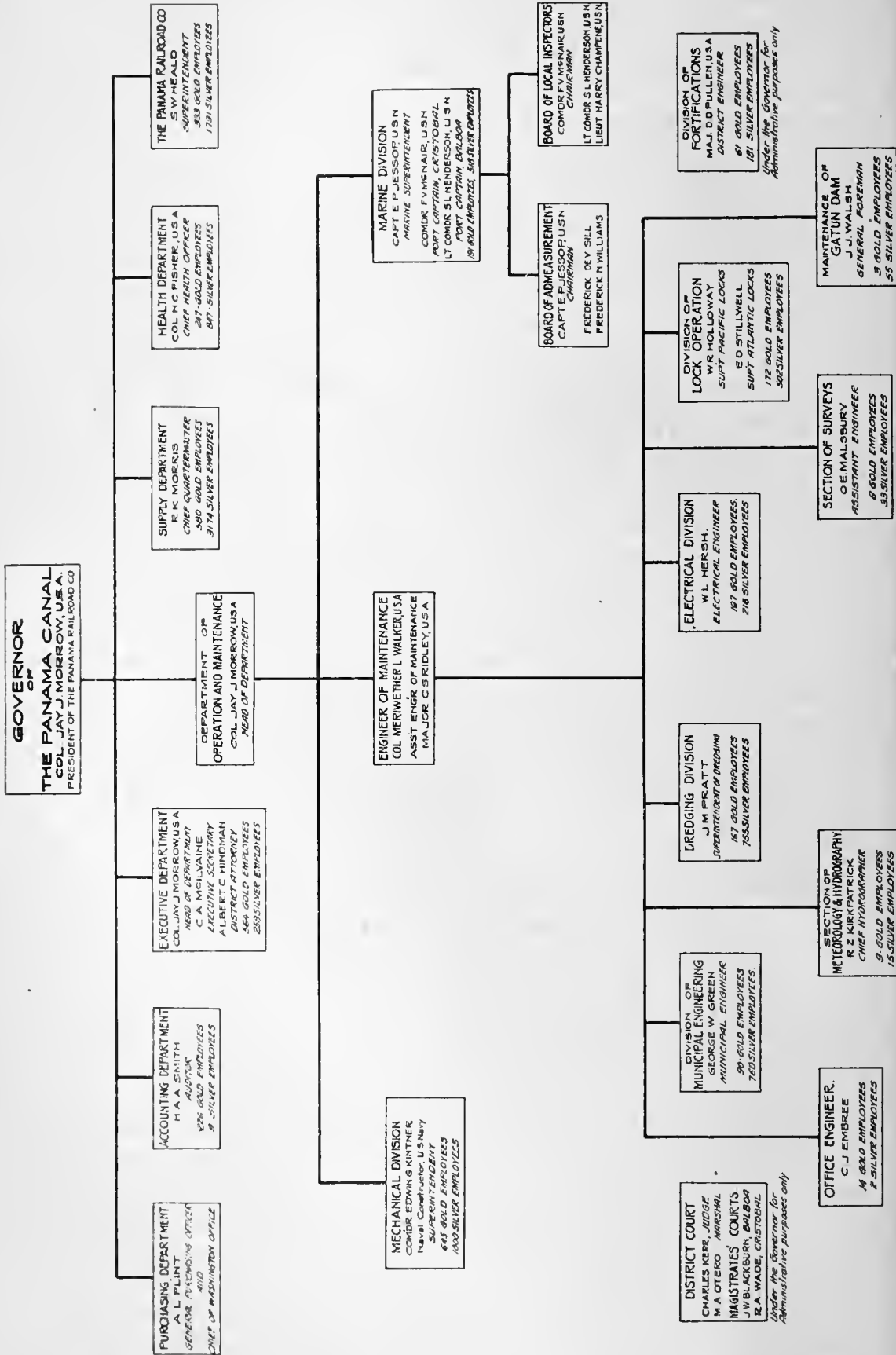
Mr. Alfred H. Mohr was appointed collector on December 16, 1920, to succeed Maj. T. L. Clear, who had accepted a commission in the United States Army.

Surg. W. C. Rucker, of the Public Health Service, was appointed chief quarantine officer on October 28, 1920, succeeding Dr. S. B. Grubbs, returned to duty with the Public Health Service.

The district judge, John W. Hanan, resigned toward the end of the fiscal year, and Charles Kerr was appointed to succeed him. Judge Kerr did not assume the duties of his office, however, until July 16 of the new fiscal year. This entry is made as a matter of record only. The district court is independent of the executive and is associated with it only for convenience of handling administrative details.

ADMINISTRATIVE POLICY.

No changes were made in administrative policy during the year, although variations in details were necessary from time to time. The work on the Isthmus was handled as though in one organization, the heads of departments of The Panama Canal reporting to the Governor, and the superintendent of the Panama Railroad reporting to the president of the railroad, the incumbent of both offices being



the same. The general administration is centered in the executive office, and the accounting work in the accounting department; the Panama Railroad and other divisions of the general organization being billed for their proper share of the general overhead work. The organization charts which are published herewith show the lines of responsibility and the various divisions into which the work is separated for convenience in administration.

BUDGET AND ECONOMIES.

In accordance with the provisions of the budget and accounting act of June 10, 1921, the work of preparing estimates for the fiscal year 1922 was begun immediately after receipt of instructions from the Director of the Bureau of the Budget. The auditor of The Panama Canal, Mr. H. A. A. Smith, who is head of the accounting department and has been charged in past years with the preparation of estimates and making of allotments, was appointed budget officer for this organization. Steps toward making economies had been taken months before the passage of the new budget law, and the efforts of the Director of the Bureau of the Budget to promote both economy and efficiency found The Panama Canal already well along with the aims he has in view.

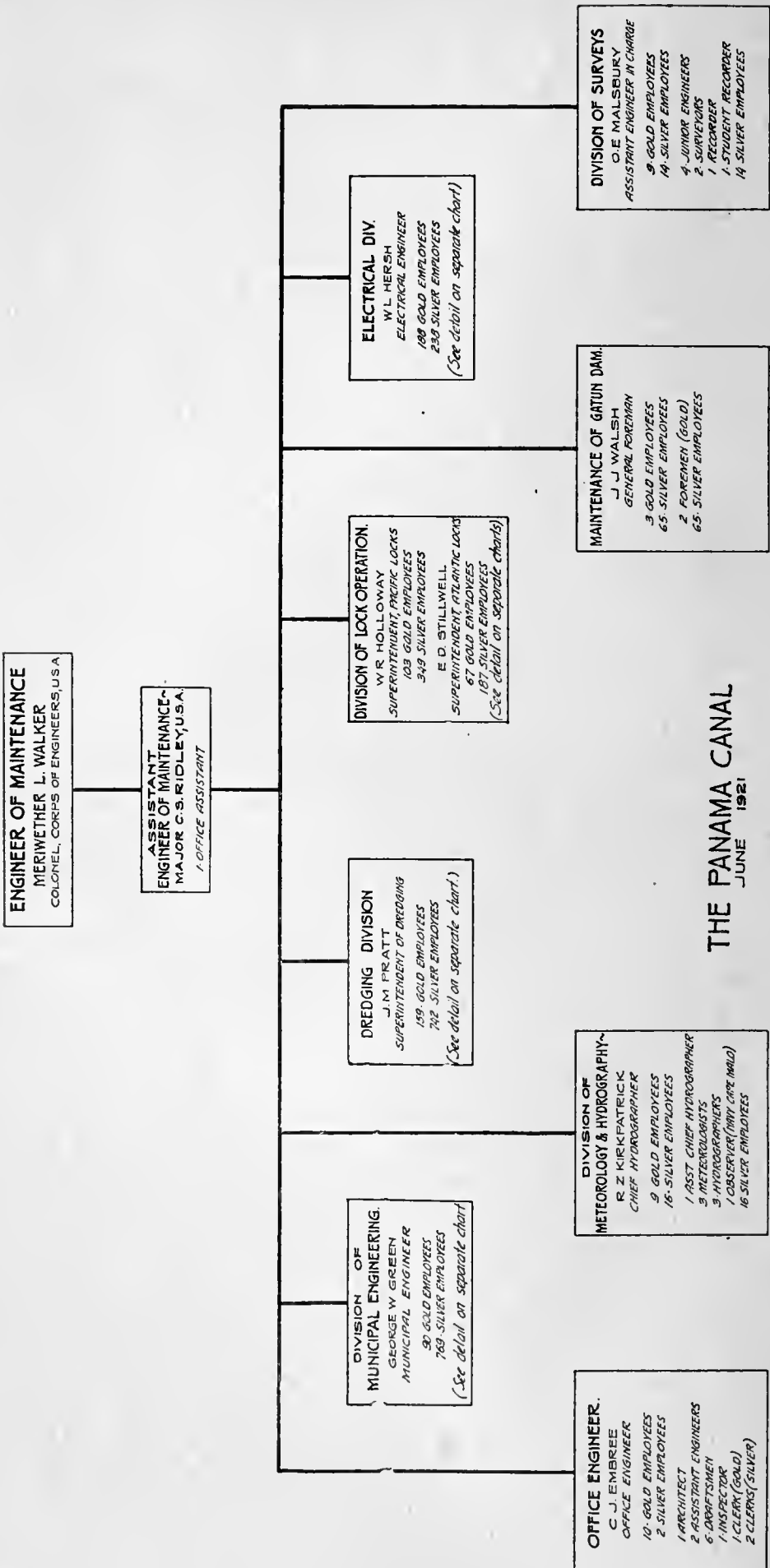
Measures of economy under way at the close of the fiscal year included: (a) Reductions in wages in accord with reductions in the United States and with the cost of living; (b) reductions in force on account of lessened work; (c) studies in canal operation forces with idea of reducing number of employees; (d) reducing amount of stock in warehouses; (e) reducing paper work and printing bills. Substantial savings have been made, and the efforts will be continued to the end that the balance which The Panama Canal turns into the Treasury each year (already a substantial amount) may be increased.

ACCOUNTING.

The system of accounting, embracing both Government and commercial methods adapted to the peculiar conditions of the canal and related work, was continued along established lines. A study of the organization chart of the accounting department and of the fiscal tables in Section V will give insight of the broad outlines of this work. The auditor, who is head of this department, is preparing an analysis and explanation of the system, which will be available shortly.

THE WORKING FORCE.

The working force of the organization, both on the Isthmus and in the United States, at the close of the fiscal years 1920 and 1921 is as shown in the table following.



Department or division.	1920			1921		
	Gold roll.	Silver roll.	Total.	Gold roll.	Silver roll.	Total.
Operation and maintenance:						
Office.....	41	40	81	31	50	81
Building division.....	512	1,375	1,887			
Electrical.....	247	257	504	197	216	413
Municipal engineering.....	115	1,190	1,305	90	760	850
Lock operation.....	170	588	758	175	557	732
Dredging.....	185	1,123	1,308	167	755	922
Mechanical.....	1,027	1,629	2,656	645	1,000	1,645
Marine.....	184	505	689	191	518	709
Fortifications.....	58	227	285	61	181	242
Supply:						
Quartermaster.....	208	1,782	1,990	279	1,474	1,753
Subsistence.....	35	400	435	33	299	332
Commissary ¹	317	1,606	1,923	239	1,166	1,405
Cattle industry, plantations ¹	27	591	618	19	154	173
Hotel Washington ¹	11	95	106	10	81	91
Accounting.....	253	9	262	226	9	235
Health.....	252	900	1,152	246	847	1,093
Executive.....	567	230	797	564	258	822
Panama Railroad:						
Superintendent.....	76	567	643	61	332	393
Transportation.....	147	182	329	94	125	219
Receiving and forwarding agent.....	98	2,271	2,369	66	687	753
Coaling stations.....	120	805	925	112	566	678
Washington office, Panama Canal.....	141		141	134		134
New York office, Panama R. R. Co.....	1,373		1,373	1,005		1,005
Total.....	6,164	16,372	22,536	4,645	10,035	14,680

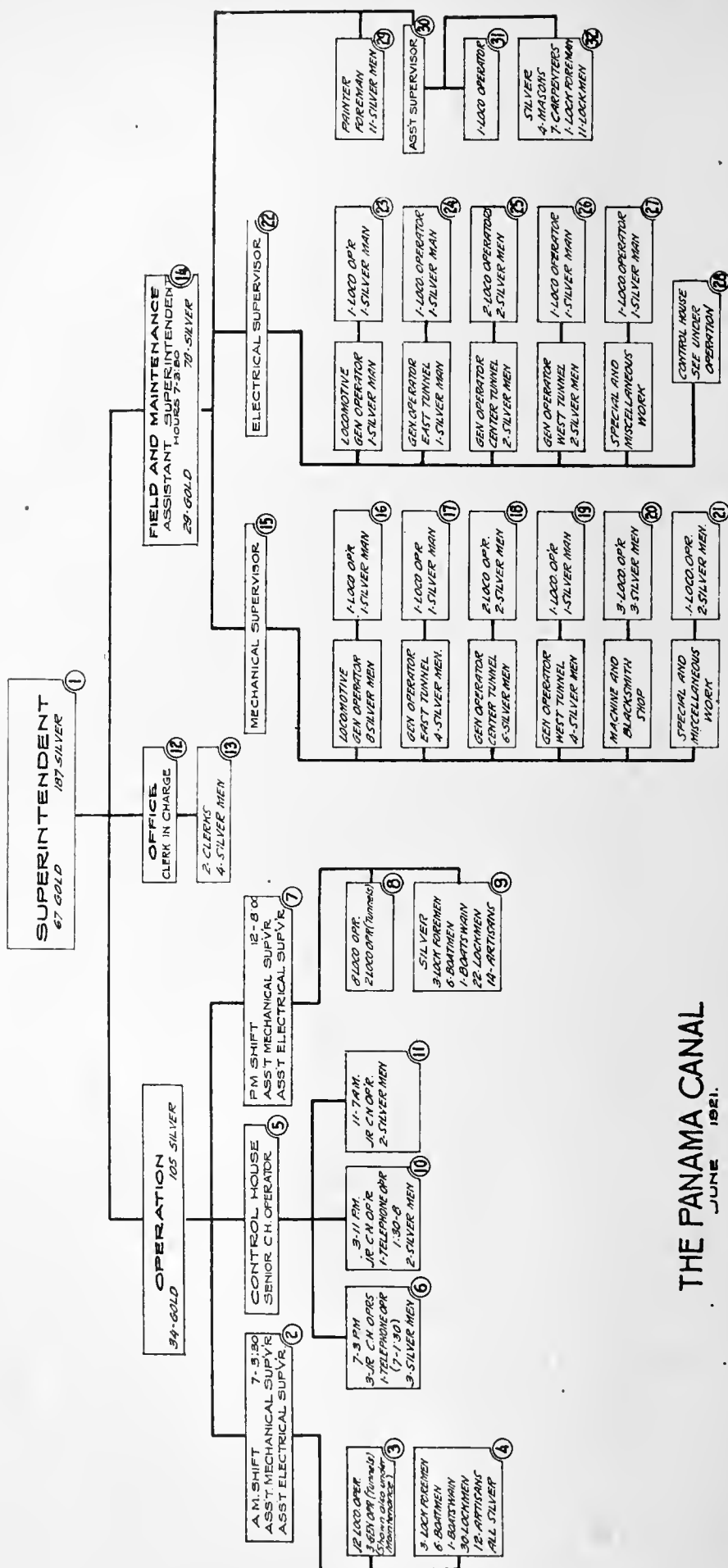
¹ Divisions of the Panama Railroad, but administered by supply department.

² Includes employees in Haiti and on steamers.

The reduction of force that is indicated between 1920 and 1921 actually continued throughout the first month of the new fiscal year, and the total is now less than it was at the end of June. From the figures above, however, it will be seen that the gold roll, or American, force has been reduced by 1,144 men, and the silver roll, or laboring, force, made up chiefly of West Indians, has been reduced by 6,337 men. The reductions in force are due principally to two causes: First, the end of building construction work for the Army, which eliminated entirely the building division; and, second, the world depression in the shipping business, which has cut down materially the amount of work in the mechanical shops and in other services to shipping.

It will be noticed that there have been comparatively small cuts in the purely administrative force under the executive and accounting departments. On the other hand, a material increase in the productive force would not result in an appreciable increase in the number of administrative workers. There is presented here the common situation of overhead force neither increasing nor decreasing in exact proportion to the number of productive workers. However, in April of the past year I directed the executive secretary, the acting auditor, and the marine superintendent to make a careful survey of the administrative work, with the idea in view of cutting down the number of employees on such work. As the result of the study begun at that time and of the general reduction of force, we

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have found it possible to eliminate 25 positions in these departments since the end of the fiscal year, making a total reduction since the beginning of the fiscal year 1921 of over 50 men in this force. A reduction along similar lines has been made in the health department, due to a lessening of field work, making possible a reorganization of the method of handling it.

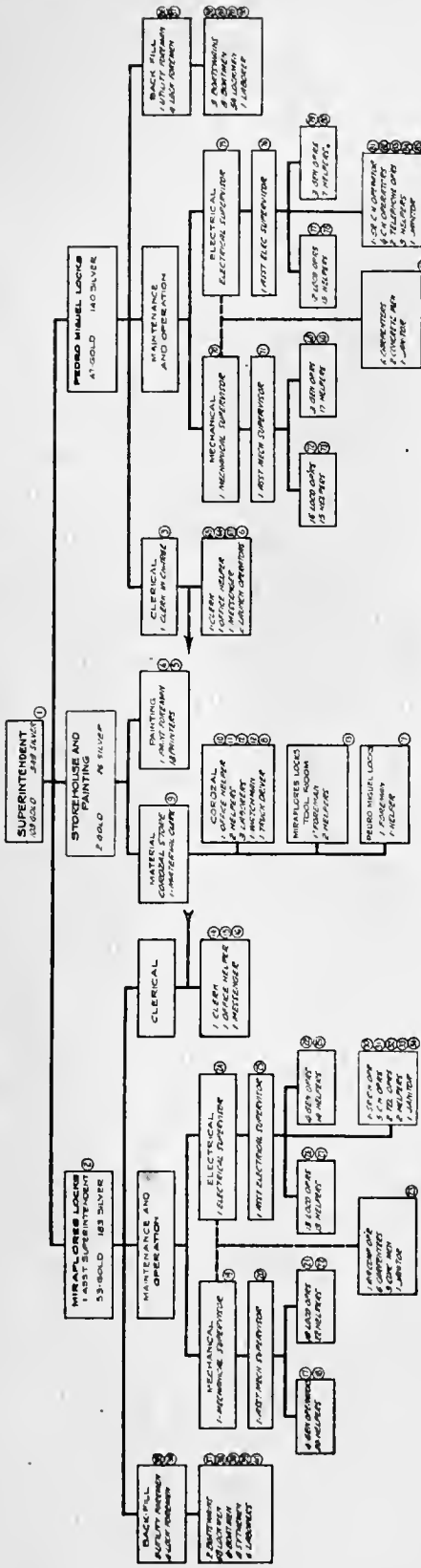
In the municipal engineering division the reduction of approximately 500 men is due, likewise, to the completion of work at the Army posts, where this division was engaged in street and sidewalk construction and grading.

In the dredging division there has been a slight decrease in the number of gold roll employees and a decrease of nearly 300 in the silver roll employees. The necessity for continuing the dredging organization on a basis for emergency has been referred to in Section I of this report. The routine maintenance work will always require a dredging force, but until the danger of interruption by slides has been put entirely behind us, it will be necessary to keep a force capable of doing emergency work in large volume. This force is not kept idle, but is working to advantage at all times on such excavation as will anticipate further slides or as is useful to various parts of the work.

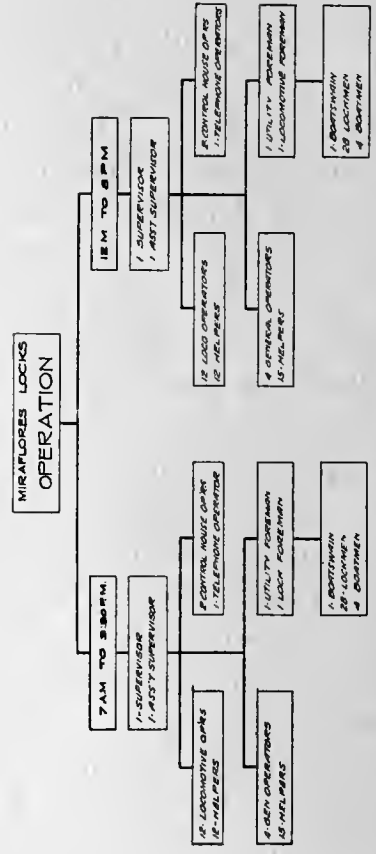
There has been an actual increase of 5 men on the gold force of the lock operation division and a decrease of 31 men on the silver force. So small a fluctuation as this may be due at any time to maintenance conditions that may be different at the end of each fiscal year. Shortly after the arrival of the assistant engineer of maintenance in May, 1921, I directed him to take up a study already begun by me to determine if it would not be possible to cut down the force at the locks by a different method of handling the ships without any, or appreciable, decrease in the efficiency of making lockages. These studies were in progress at the end of the fiscal year, but inasmuch as they involve not only the theory but also experimentation under actual working conditions, it is impossible to state when the results will be known. One point must be kept in mind in this connection, viz, with the great care already used we are obliged to pay each year several thousands of dollars in repairs to damages incurred by ships at the locks, and that a lowering in efficiency of handling the ships at the locks might easily lead to a great increase in the amount of damages to be repaired.

In Section II of this report reference has already been made to the decrease in force of the mechanical division, and attention has been called to the fact that this force is now below the point at which it should be kept in order to guarantee prompt and efficient work of any magnitude either for the Navy or for commercial vessels. Inasmuch as it is a military as well as a commercial necessity to

PACIFIC LOCKS ORGANIZATION - June 30, 1921.



NOTE: For operation of locks the organization shown below is required. The organization shown above is for the purpose of maintenance and painting force shown above. When not operating this force returns to maintenance work. This applies both to Miraflores and Pedro Miguel Locks.



Operating force for Pedro Miguel Locks is the same as above except there are 3 General Operators on both shifts and no Utility Foreman on 7 AM to 3 PM.

maintain shops here that are capable of doing big repair jobs on ships at short notice, it is believed that our efforts to procure from the Navy Department and the Army a certain amount of the repair work that they have constantly on hand should be more carefully considered than is apparent.

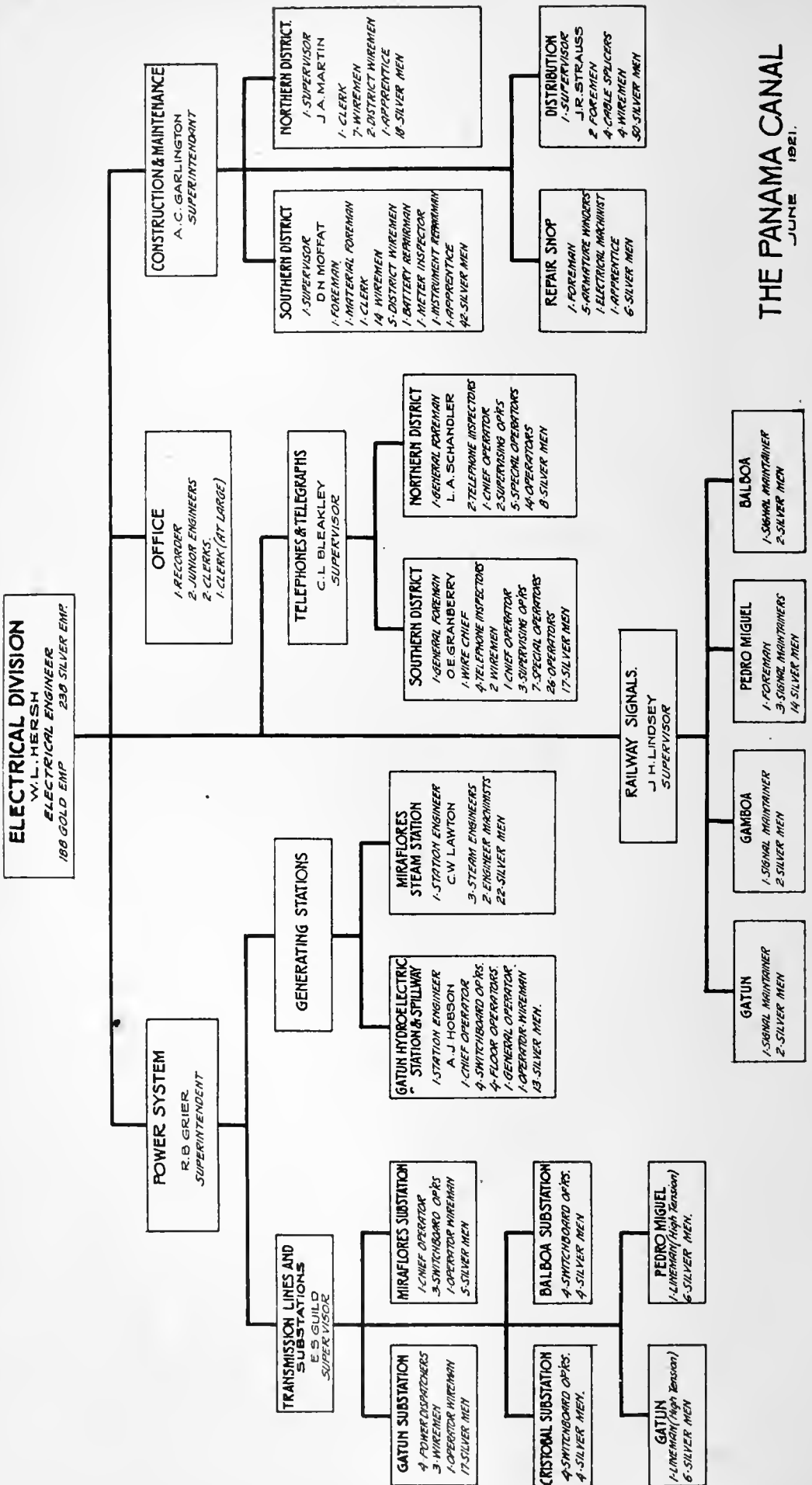
In the commissary division there has been a gross reduction of over 500 employees. This is due to a less total number of employees purchasing at the commissaries and to the falling off in various lines of the work, making it possible to reduce force by doubling up.

The figures for cattle industry and plantations are not conclusive, because the cattle-industry force is somewhat casual, but it is true that there has been an intrinsic reduction in this end of the work, due to the fact that most of the virgin clearing has been completed, that the chicken industry has been practically abandoned, and that several more of the plantations have been let out to contract.

In the transportation force of the Panama Railroad the reduction is due to the falling off of construction work and to the closing down of the Cascadas branch and to a decrease in the amount of freight being handled. A further reduction has been made in the new fiscal year as the result of studies begun in the year 1921 on account of a curtailment of the passenger service.

The total figures for the receiving and forwarding agency and the coaling stations are indicative of very little, because the laboring force engaged at both plants is largely casual. The figures of the gold-roll force, however, do signify a certain change. At the receiving and forwarding agency this reduction in force is due to the less amount of cargo being handled, and at the coaling station is due to the fact that we are working on a two-shift instead of a three-shift basis.

In considering the working force of The Panama Canal and the Panama Railroad on the Isthmus, the main classes of work done, viz, canal operation, business operations, and government, should be kept in mind. For the mere work of operating the canal a force of about 3,000 men is sufficient. For the various activities of the Government, which include the activities of National, State, and municipal governments in the United States, a force of about 2,000 men is necessary. More people are employed in the business operations—that is, in the operations that pay for themselves and actually return some profit—than in the other two branches combined. An effort has been made to show this fact in the table herewith, entitled "Force at work in June, 1921, divided as to work on which engaged and as to pay received." From this statement and the organization charts a fairly accurate idea of the method of administering the whole work and the cost of each part thereof can be obtained.

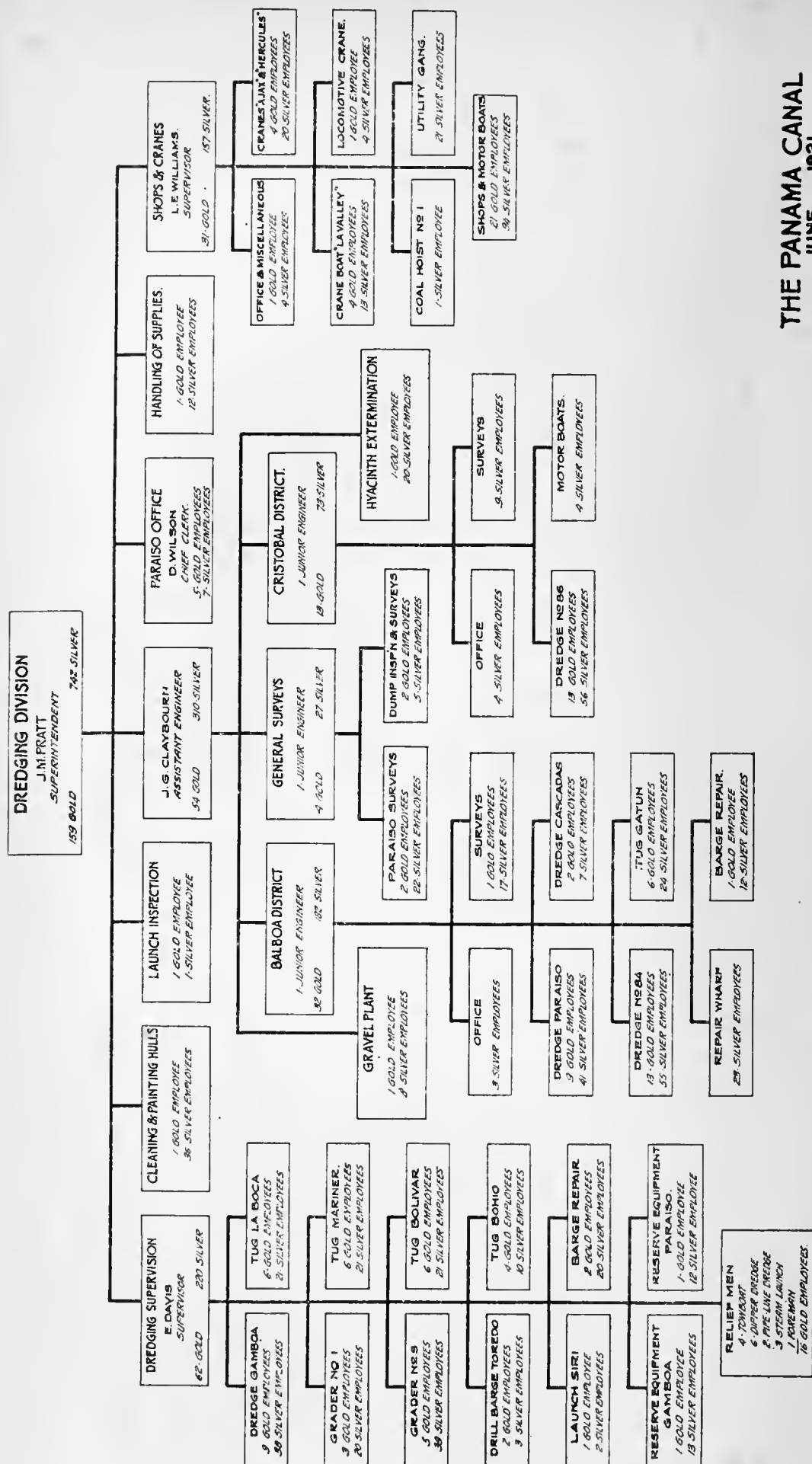


THE PANAMA CANAL
JUNE 1921.

Force at work in June, 1921, divided as to work on which engaged and as to pay received.

Department or division.	Force.						Salaries and wages paid.												
	Canal operation.		Business operations.		Government.		Total.		Canal operation.			Business operations.			Government.			Total.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.	
Executive.....	57	26	250	128	262	103	569	257	\$10,302.75	\$1,601.86	\$45,187.50	\$7,886.08	\$47,356.50	\$6,345.83	\$102,841.33	\$15,834.78			
Accounting.....	23	1	164	7	38	1	225	9	4,354.59	76.04	31,050.12	532.28	7,194.54	76.04	42,599.78	684.42			
Meteorology and hydrography.....	4	8			5	9	9	17	823.00	362.24			1,028.75	407.52	1,851.78	769.71			
Surveys.....	5	17			4	16	9	33	947.10	785.74			757.68	739.52	1,704.75	1,524.66			
Office engineer.....	6	1			6	1	12	2	1,602.42	67.50			1,602.42	67.50	3,204.88	135.00			
Municipal engineer.....			40	295	60	442	100	737			9,448.00	17,021.50	14,172.00	25,503.40	23,619.83	42,530.73			
Supply (buildings and supplies).....	14	76	214	1,145	58	306	286	1,527	3,982.58	4,860.96	60,906.58	73,234.20	16,499.26	19,571.76	81,357.80	97,666.03			
Health.....			97	343	145	523	242	866			18,520.21	15,778.00	27,884.85	24,058.00	46,206.58	39,834.86			
Marine.....	142	382	32	86	19	52	193	520	37,275.00	22,274.42	8,400.00	5,014.66	4,987.50	3,032.12	50,662.31	30,320.04			
Dredging.....	175	717					175	717	42,622.73	43,571.98					42,622.73	43,571.98			
Locks and dams.....	175	576					175	576	46,455.42	33,999.64					46,455.42	33,999.64			
Electrical.....	93	119	69	88	24	32	186	239	19,270.53	6,252.26	14,297.49	4,623.52	4,973.04	1,681.28	38,540.95	12,557.25			
Mechanical.....	202	328	474	765			676	1,093	48,213.36	17,734.96	113,134.32	41,363.55			161,346.61	59,093.09			
Panama Railroad:																			
Commissary.....			247	1,167			247	1,167			42,020.46	57,854.44			42,020.46	57,854.44			
Cattle industry.....			21	153			21	153			5,433.29	7,125.80			5,433.29	7,125.80			
Hotel Washington.....			10	86			10	86			1,308.50	3,293.65			1,308.50	3,293.65			
Superintendent.....			65	346			65	346			15,779.68	17,264.31			15,779.68	17,264.31			
Transportation.....			94	126			94	126			27,601.73	8,271.65			27,601.73	8,271.65			
Receiving and forwarding agency.....			66	675			66	675			13,399.06	57,134.95			13,399.06	57,134.95			
Coaling plants.....			112	659			112	659			26,476.94	39,447.64			26,476.94	39,447.64			
Total.....	896	2,251	1,955	6,069	621	1,485	3,472	9,805	215,849.48	131,587.60	432,933.88	355,846.23	126,256.54	81,482.97	775,037.41	568,914.63			

¹ Balance in money is not exact, because fractions of a cent were disregarded.



WAGE ADJUSTMENTS—GOLD EMPLOYEES.

The policy of adjusting wages of American employees on the basis of similar employment in the United States was continued. The system is to ascertain an average of wages for various classes in communities in the United States where conditions of living are fairly comparable with conditions on the Canal Zone and to add to this average 25 per cent to determine a rate for the canal service. Government wages in continental United States are used as a base, where the Government is doing work comparable with that done at the canal; otherwise, comparable private employment is used as a guide. The data procured from the United States are presented to the Governor, who is charged with the fixing of compensation. He is advised in this work by the executives in charge of departments or divisions and by a board on rates of pay.

This board, which was established in 1919 and continued to function in 1921 along lines indicated in the reports for 1919 and 1920, is composed of a representative of organized employees and a representative of the Government. It held 29 meetings during the fiscal year, made recommendations to the Governor in 71 separate cases, and held 19 hearings of employees. It is a valuable auxiliary in promoting a sense of fairness and contentment in the working force, and unless reasons not now apparent make a change in policy necessary, in this connection, it is my intention to continue the board and the policy of allowing employees to be represented in the determination of rates of pay.

Adjustments followed the trend of wages in the United States, which was upward in the first half of the year and downward during the second half.

RECRUITING IN THE UNITED STATES.

The recruiting of American workmen was continued by the Washington office, as in previous years. During the first half of the year it was difficult to obtain good men, but as soon as work slackened in the United States it also lessened on the Isthmus and during the second half of the year, when there was little demand on our part for more men, we could have obtained any number in the United States. The Washington office tendered employment to 704 persons, and of these 495 accepted and were appointed. These covered 78 different positions, but the majority of them were for the building trades.

LIVING COSTS AND WAGE INCREASES.

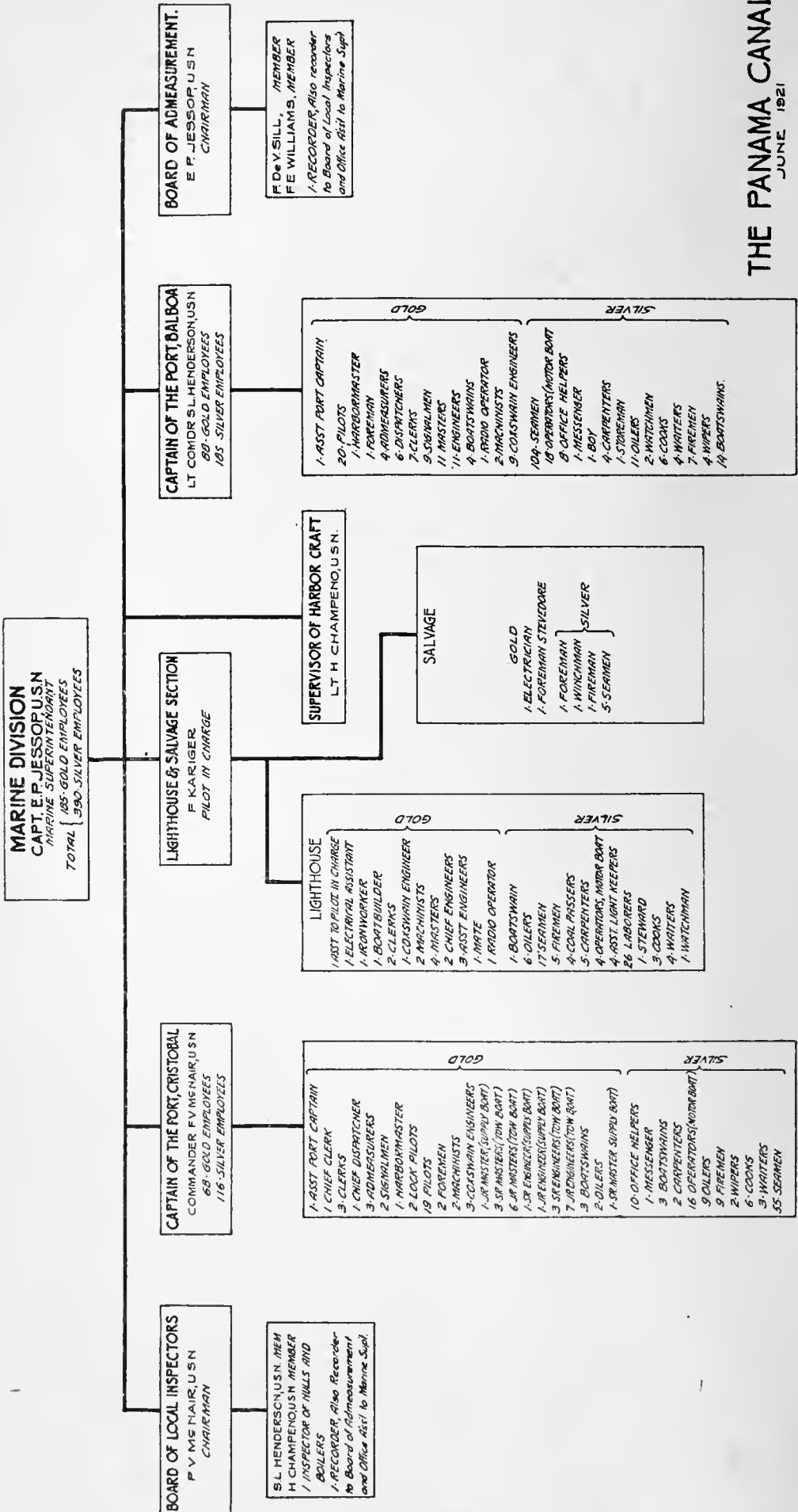
Inasmuch as the rates of pay for American employees are fixed on the basis of rates for similar employment in the United States, and as the greater part of the staple foods and clothing sold in the commis-

saries are purchased in the United States, no effort has been made to adjust wages on the Isthmus in proportion to the increase in the cost of living. The law forbids The Panama Canal to pay more than 25 per cent in excess of wages for the same or similar work under the Government in the United States, and if the wages of any class in the United States had not increased in proportion to the cost of living, this condition would be reflected in the rates for the same class on the Isthmus. As a matter of fact, it has been so reflected. From studies of living costs used in the adjustment of wages for the West Indian, or labor force, in which the cheaper staple articles are used as a basis, we have found that the increase in necessities on the Isthmus, as of July 1, 1920, over July 1, 1914, was 89.11 per cent and the increase as of July 1, 1921, over July 1, 1914, was 68.97 per cent. Taking the first-class rate of pay for various journeymen (workers without supervisory duties) the following comparison of increase in wages and in the cost of living on the Isthmus has been made:

	Maximum wage.			Percentage of increase over 1914.	
	1914 ¹	1920	1921	July 1, 1920.	July 1, 1921.
Draftsmen:	<i>Per month.</i>	<i>Per month.</i>	<i>Per month.</i>		
Architect.....	\$200.00	\$241.66	\$241.66	20.83	20.83
Marine.....	200.00	285.41	273.00	42.70	36.50
Fireman (F. D.).....	110.00	172.91	172.91	57.19	57.19
Civil engineer (surveyor).....	175.00	206.25	206.25	17.85	17.85
Commissary manager.....	250.00	300.00	300.00	20.00	20.00
Nurse (female) (S).....	85.00	105.00	105.00	23.53	23.53
Storekeeper.....	200.00	275.00	275.00	37.50	37.50
Teacher (grade school).....	150.00	160.27	186.67	6.85	24.45
Physician.....	250.00	275.00	325.00	10.00	30.00
Policeman.....	110.00	172.91	172.91	57.19	57.19
Clerk.....	175.00	200.00	220.83	14.29	26.19
	<i>Per hour.</i>	<i>Per hour.</i>	<i>Per hour.</i>		
Blacksmith.....	\$0.65	\$1.06	\$1.05	63.08	61.54
Boilermaker.....	.65	1.06	1.05	63.08	61.54
Chipper and caulker.....	.65	1.06	1.05	63.08	61.54
Machinist.....	.65	1.06	1.05	63.08	61.54
Molder.....	.65	1.06	1.13	63.08	73.85
Pipe fitter.....	.65	1.06	1.05	63.08	61.54
Shipfitter.....	.65	1.06	1.05	63.08	61.54
Wireman.....	.65	1.06	1.05	63.08	61.54
Welder (gas).....	.65	1.06	1.05	63.08	61.54
Bricklayer ¹.....	.75	1.34	1.46	78.67	94.67
Painter ¹.....	.56	1.19	1.23	112.50	119.64
Plasterer ¹.....	.70	1.35	1.47	92.85	110.00
Plumber ¹.....	.75	1.30	1.41	73.33	88.00
Carpenter ¹.....	.65	1.23	1.31	89.23	101.54
Percentage of increase in living costs.....				89.11	68.97

¹ Wage scale as of Apr. 1, 1921.

It will be noticed that in most cases increase in wages has not kept pace with the increase in cost of living, based on articles of necessity only and without relation to an advance in the standard of living.



RATES OF PAY—SILVER EMPLOYEES.

Schedules of pay of silver-roll employees (mostly West Indians) were adjusted every three months on the basis of changes in the cost of living. Studies of living costs compared with 1914 guided the action of the board on rates of pay, silver roll, which is composed of heads of divisions. The standard rate for laborers on July 1, 1920, was 23 cents an hour. The board felt that changes in living costs during the year were not sufficient to justify it in recommending a change in this rate until the meeting held in June, 1921, when a reduction of 1 cent an hour, effective July 1, 1921, was recommended, which the Governor approved. In connection with the adjustment of wages of this class, it is pertinent that wages in the canal service are always somewhat higher than in the Caribbean countries, while the cost of the imported articles is lower. On the other hand, the living conditions in the Caribbean countries are rural or semirural, while on the Isthmus they are comparable with those of industrial communities in the United States.

LIVING COSTS.

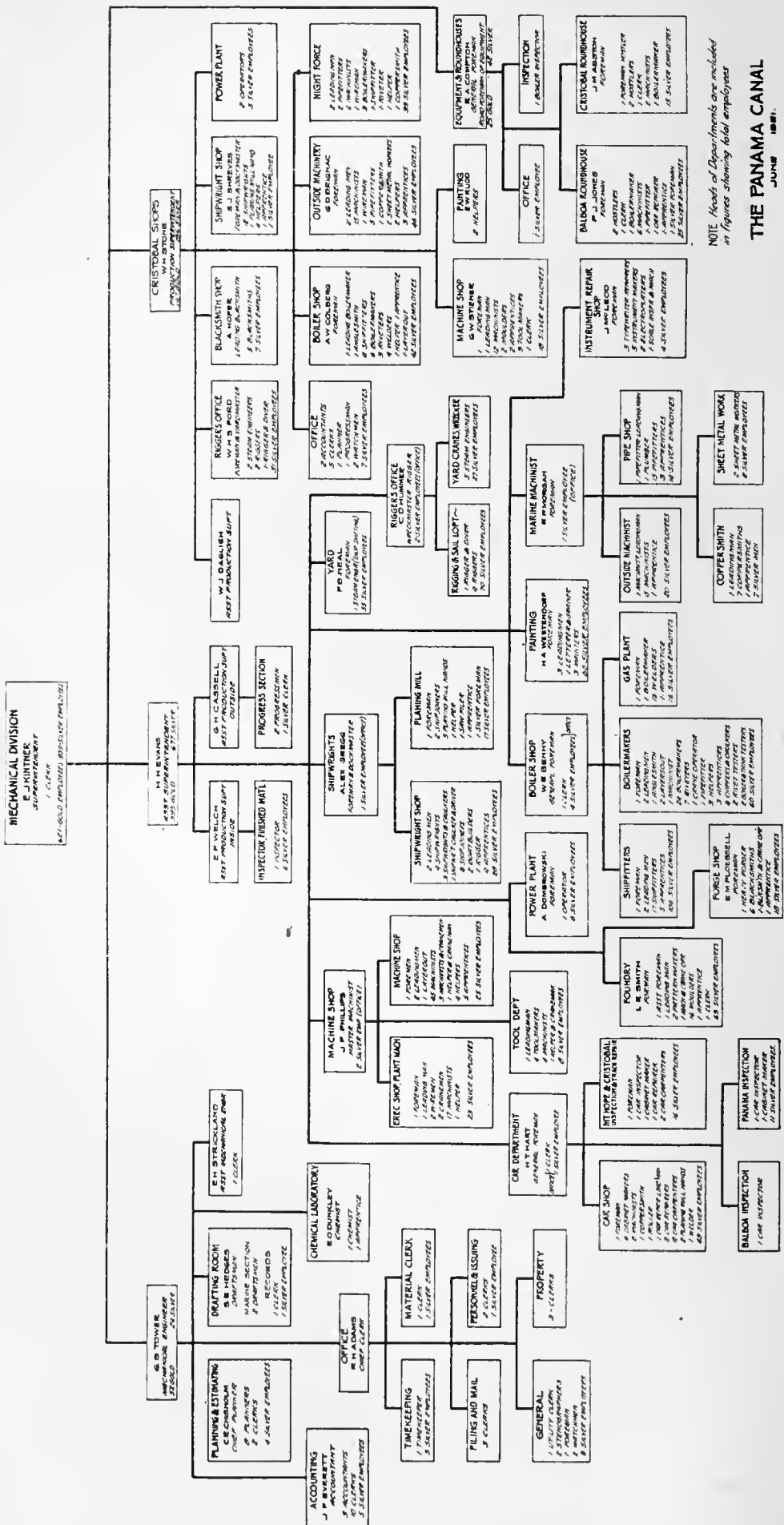
Studies of living costs showed the following:

Item.	Weight.	Increase over July 1, 1914.				
		1920		1921		
		July.	October.	January.	April.	July.
Food.....	54	101.11	98.17	77.3	62.1	63.88
Clothing.....	21	71.59	73.81	78.2	89.7	80.75
Household.....	15	105.30	123.8	127.59	119.89	103.45
Personal.....	3	65.47	67.9	67.9	67.89	66.86
Rent.....	7					
Weighted average.....		87.39	89.11	79.28	72.39	68.97

The studies are based on articles used by the West Indian employees, which are staples of the lowest grades. They reflect fairly accurately, however, the fluctuations of living costs for all canal workers during the fiscal year 1921, compared with costs in 1914.

COMPLAINTS OF AMERICAN EMPLOYEES.

Plans perfected in 1920 for a board to hear grievances or complaints of American employees on working conditions were made effective July 13, 1920. The circular outlining the scope of the board's action was published in the annual report for 1920. This board is composed of the assistant engineer of maintenance, the head of the division in which the complaint originates, and two representatives of the em-



ployees, nominated by the central body of the employees' organizations. This board relieves the Governor of much of the routine work connected with the handling of complaints, but does not deprive any employee (American or alien) of the right of appeal to the Governor, a right that has been freely accorded since 1907. The board reports to the Governor, in whom alone the power of making a decision rests. Reports were made in 32 cases during the year.

PUBLIC AMUSEMENT AND RECREATION.

Following the plan pursued by large corporations in the United States and elsewhere, The Panama Canal continued its policy of assisting employees to find wholesome amusement and recreation near the homes of the people and under home influences. A summary of this work will be found in Appendix D of the report of the executive secretary on file in your office. Most of the activities are self-supporting as to operation, and the funds accumulated from various sources also help in paying for maintenance of clubhouses and playgrounds. It is necessary each year, however, to use some Government funds in this work. The clubhouses serve well as stabilizers of what would otherwise be a constantly shifting, unanchored population, drifting inevitably to the demoralizing influences of the inferior cabarets and saloons of Panama and Colon, or leaving the service. The United States Government has created here a unique community of workers with no responsibility of citizenship as to government, no ownership of real and but little personal property, and no encouragement (in fact, no possibility in the Canal Zone) to private enterprise of any kind. The money appropriated by Congress for the clubhouses is a necessary corollary to the living conditions resulting in the Canal Zone from our policies. This work should be maintained at its present high standard, and every possible encouragement should be given to its extension along lines already proven.

Although they are not under the direct control of the canal administration, mention is made here of other institutions that are valuable in promoting better community life. The Salvation Army maintains a Seamen's Institute at Cristobal and one at Balboa. The Army and Navy Y. M. C. A. maintains clubhouses for the men of the military service at Cristobal, Coco Solo, and Balboa. The Y. W. C. A. maintains clubhouses for girls and women at Cristobal and Balboa. The National Catholic Welfare Council maintains a community house at Balboa.

A baseball association promotes the national game and thereby adds materially to wholesome recreation.

QUARTERS FOR EMPLOYEES.

In keeping with the reduction of force, the demand for quarters for both gold and silver employees became less active toward the end of the fiscal year. All gold employees entitled to quarters had been provided for at the end of the year, although some of them in quarters that are neither convenient nor appropriate. There were 618 applications for quarters by gold employees on June 30, 1920, and on June 30, 1921, there were only 138, and these represented applications for change from low grade to better grade quarters. Among silver employees, the number of applications on file June 30, 1920, was 747, and on June 30, 1921, 156. The occupants of quarters were as follows: Americans, 2,913 men, 2,136 women, and 2,476 children—total, 7,525; Europeans, 143 men, 36 women, and 74 children; West Indians, 4,952 men, 2,514 women, and 5,136 children.

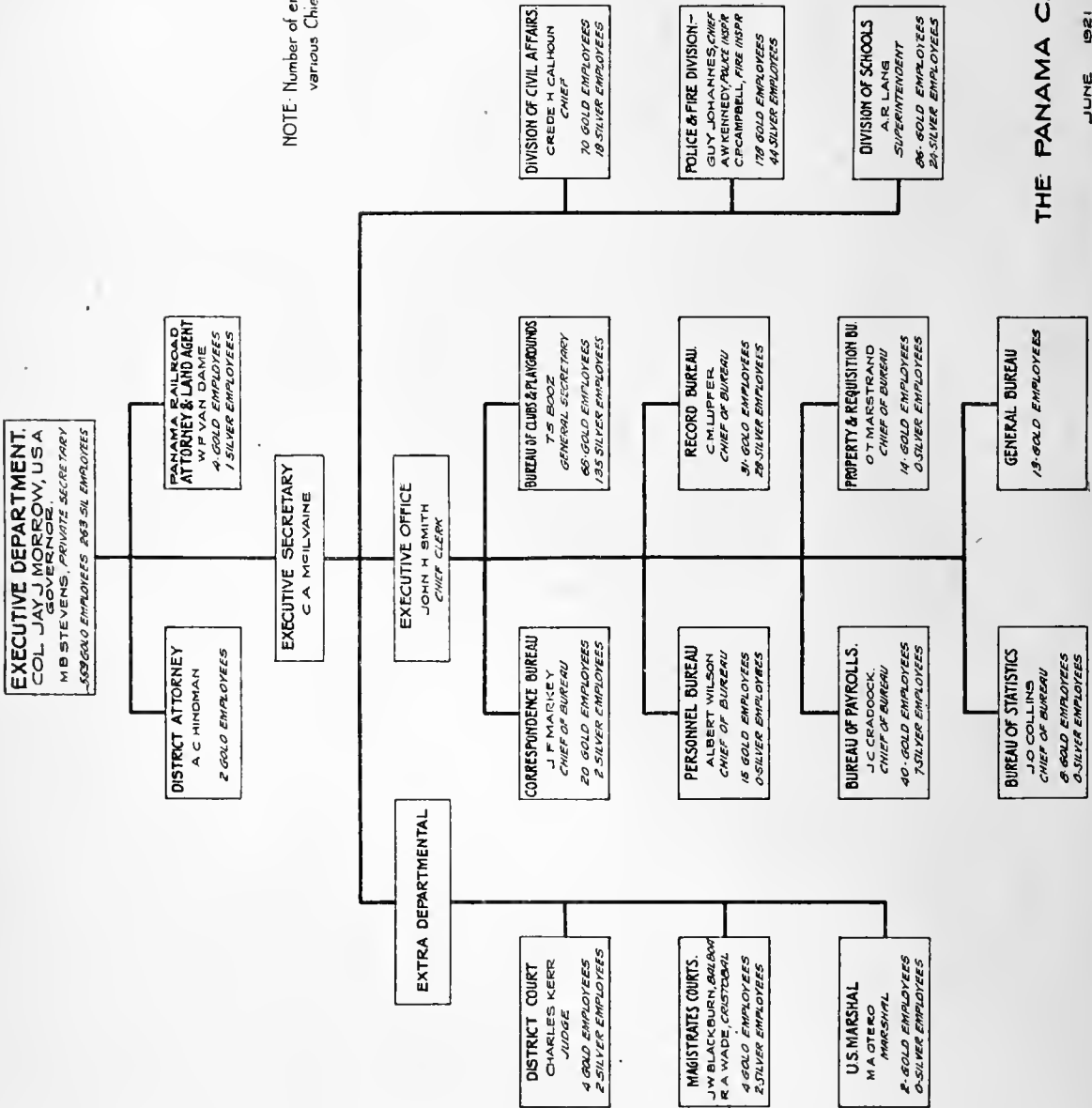
Work on new buildings at Mount Hope for quartering of West Indian employees, as described in the annual report of last year, was completed. The project consisted of 49 buildings, providing quarters for 468 families, and 10 buildings, providing 320 rooms for bachelors, and a building for a commissary. The estimated cost of these buildings was \$520,750, and the work was done within the estimate, with a saving of something over \$9,000.

It has been the policy, up to the present time, to assign quarters to American employees free of charge and to maintain these quarters and to supply light, water, and fuel. My predecessors, Gov. Goethals and Harding, both recommended that a sufficient rental charge be made for quarters to pay the expense of maintenance, and on March 1, 1915, such a plan was actually put into effect, but was discontinued by direction of the President. When the question came up again, in 1916, the collection of rental for these quarters was again postponed by direction of the President. On May 26, 1921, I sent to you a report on conditions of employment for The Panama Canal and Panama Railroad on the Isthmus as they relate (1) to the 25 per cent provision as to wages; (2) to locomotive engineers and conductors; (3) to rent for quarters occupied by employees. In this letter I favored the continuance of the provision for a wage standard 25 per cent in excess of rates paid in the United States, recommended a decrease in the rates for locomotive engineers and conductors and recommended collection of rent on account of quarters occupied by employees, on the basis of a charge sufficient to cover maintenance of the quarters and the supplying of water, light, fuel, and certain grass cutting around the premises.

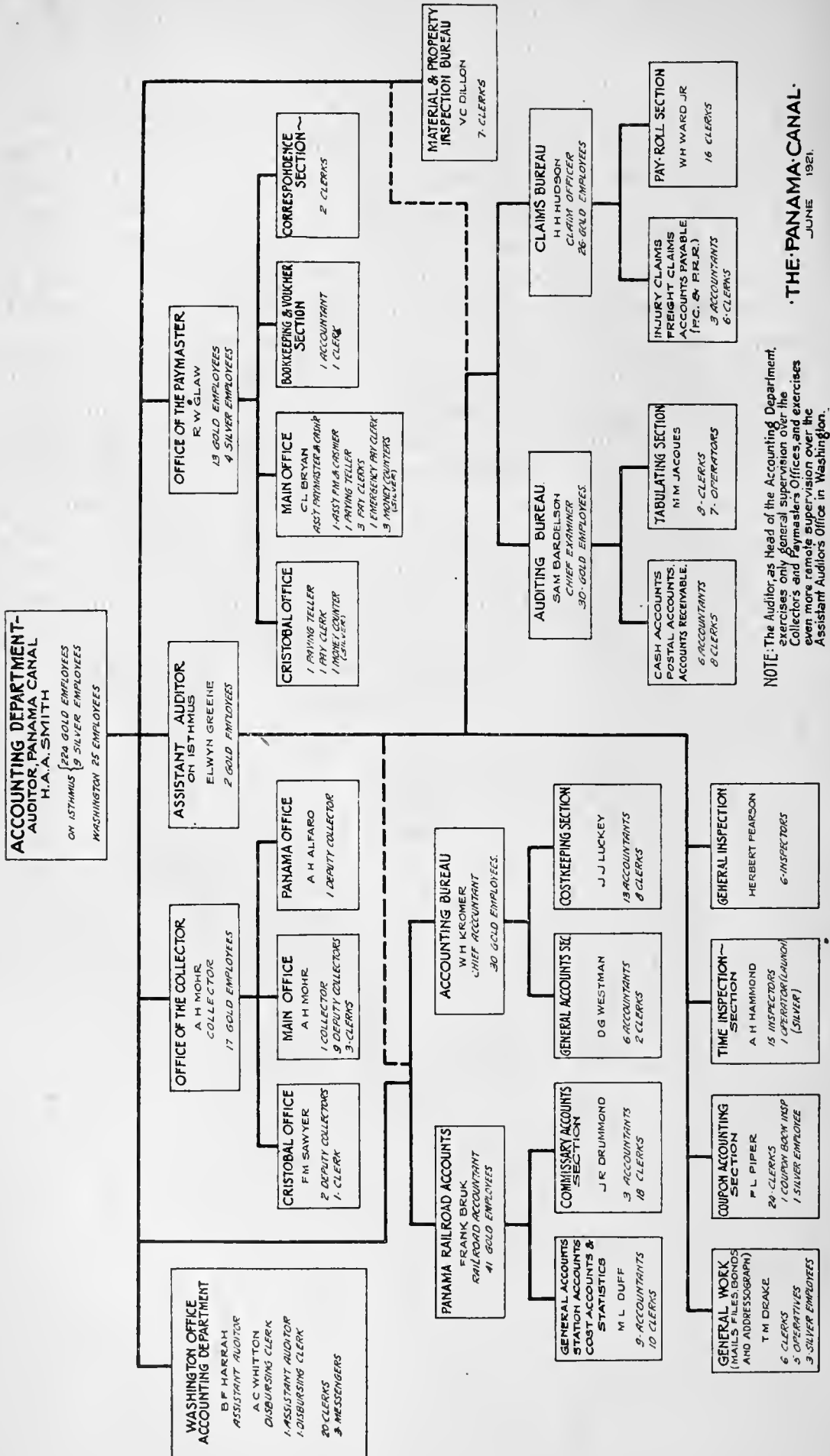
SPECIAL PANAMA CANAL COMMISSION.

On June 18, 1921, a commission, appointed by you and known as the Special Panama Canal Commission, arrived on the Isthmus,

NOTE: Number of employee as shown include various Chiefs of Divisions etc

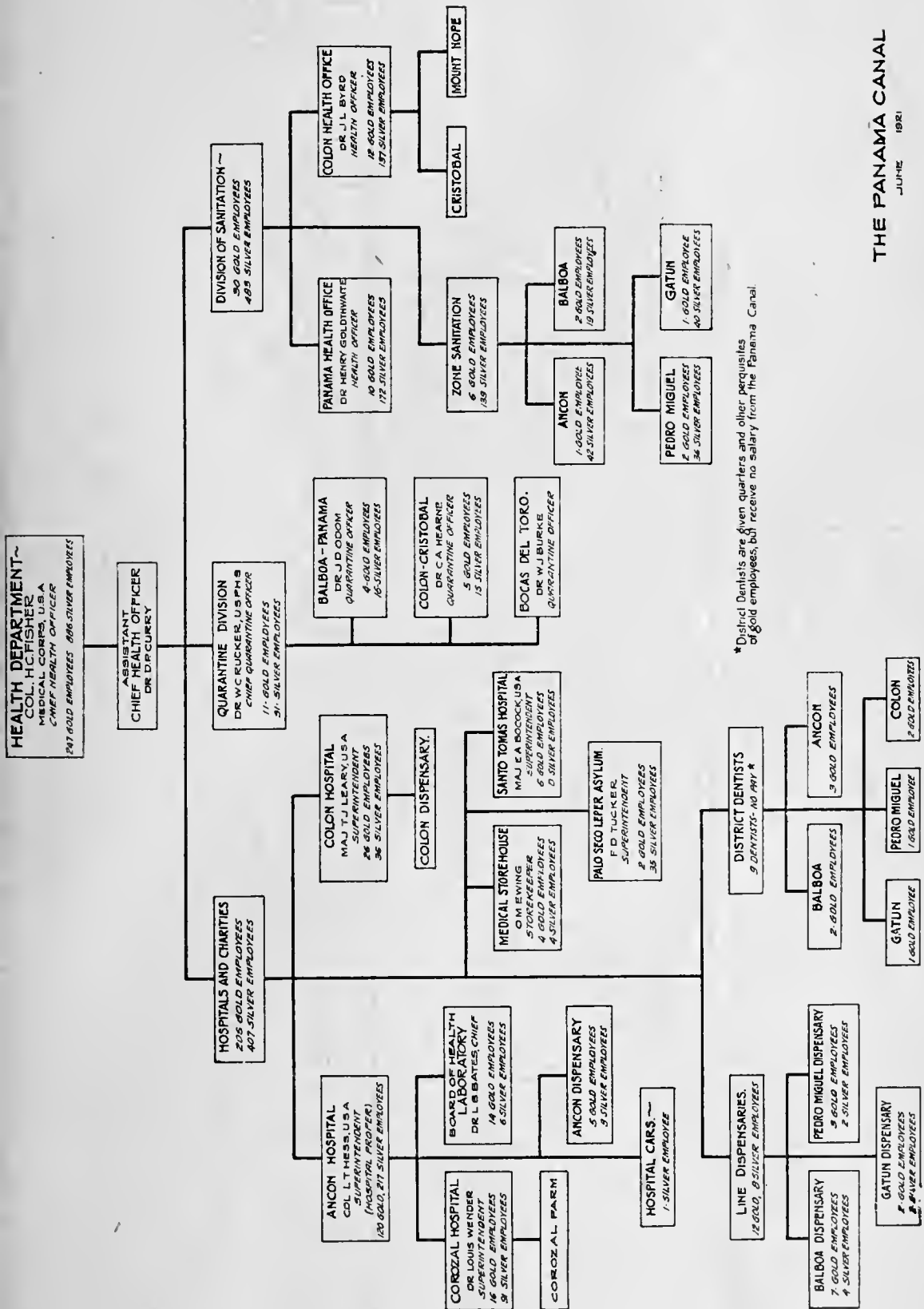


under instructions from you to report upon existing conditions and to make recommendations relative to any changes that might seem advisable. The commission consisted of Brig. Gen. Wm. D. Connor, United States Army, Capt. Alfred Brooks Fry, United States Naval Reserves, Mr. H. P. Wilson and Mr. F. A. Moliter, with Mr. E. H. Van Fossan as secretary. Mr. Moliter was obliged to leave the Isthmus on July 6, but the other members of the commission remained until July 20. No effort was spared to facilitate the work of the commission, and, in a letter to me just before his departure, the chairman of the commission thanked the canal organization for its helpful attitude. At the time this report is written I have no knowledge of the recommendations which the commission has made to you nor of the line these recommendations take. But, whether or not I can agree with the recommendations that the commission may make, I can state that its visit to the Isthmus was a distinct help to the canal organization. In conversation with me and with the heads of divisions of the canal, the members of the commission pointed out a number of details of administration that they thought could be changed to advantage, and many of the oral recommendations that they made have either been carried out or are in way of being adopted.



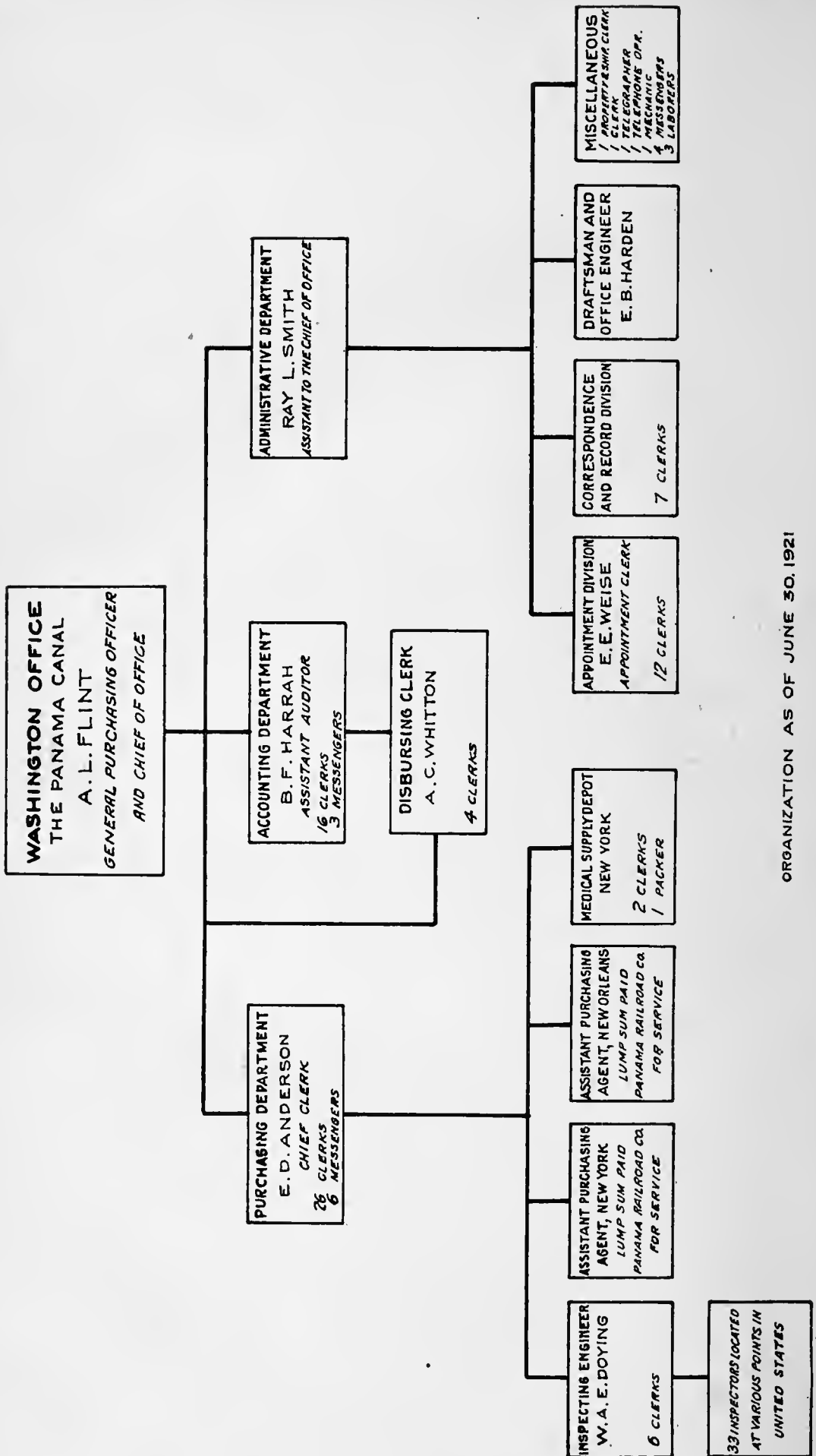
NOTE: The Auditor, as Head of the Accounting Department, exercises only general supervision over the Collectors and Paymasters Offices and exercises even more remote supervision over the Assistant Auditors Office in Washington.

THE PANAMA CANAL
JUNE 1921

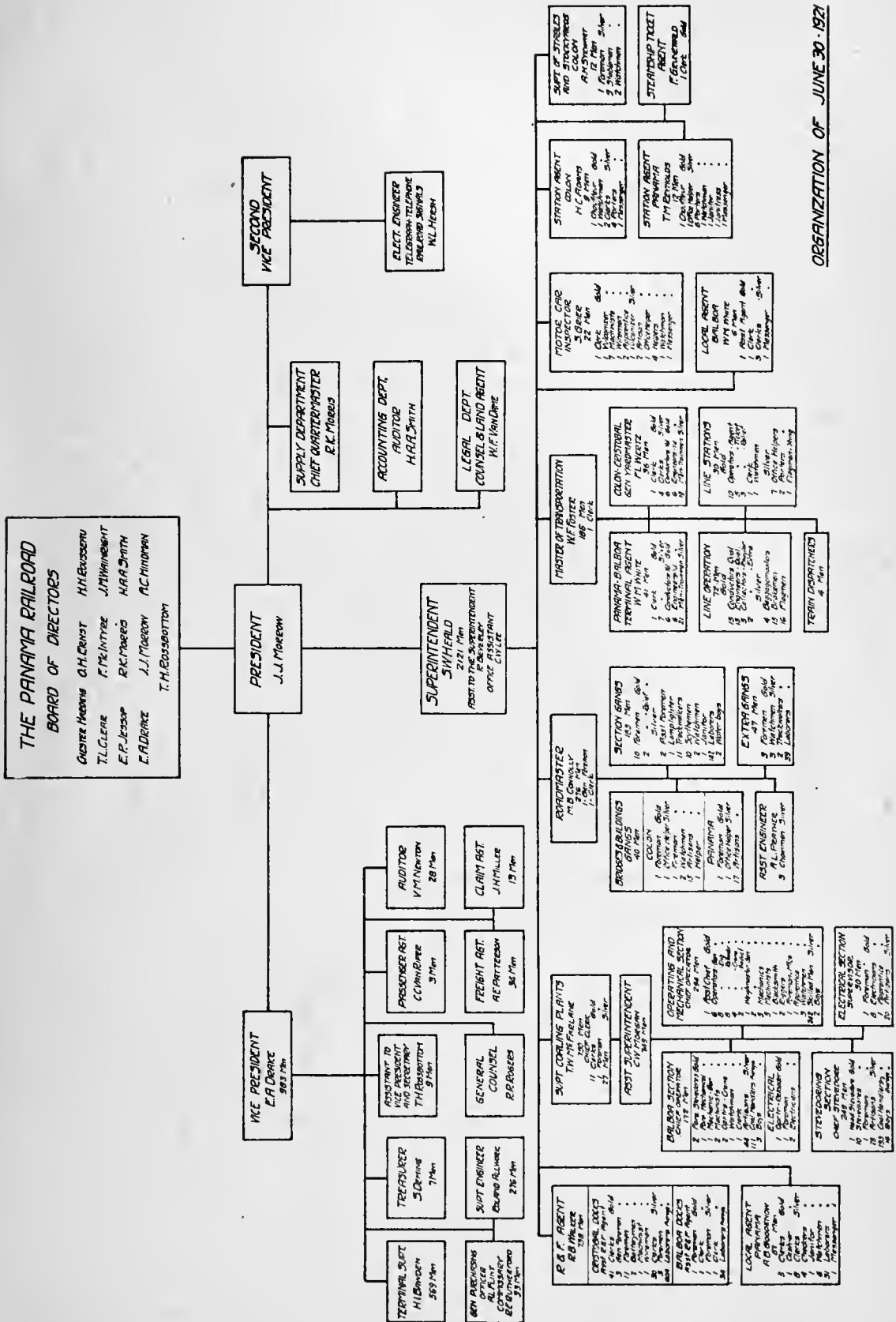


THE PANAMA CANAL

JUNE 1921



ORGANIZATION AS OF JUNE 30, 1921



ORGANIZATION OF JUNE 30, 1921

SECTION V.

FINANCIAL AND STATISTICAL STATEMENTS.

This section contains three classes of statements:

1 to 47. Financial statements of The Panama Canal.

48. Summary of Panama Railroad business on the Isthmus.

49 to 54. Statistical statements of canal operation and traffic.

More detailed information of finances will be found in the annual report of the auditor of The Panama Canal and the annual report of the Panama Railroad Co.

TABLE NO. 1.—*General balance sheet, June 30, 1921.*

DEBITS.	
Cash in hands of fiscal officers.....	\$4,600,981.44
Appropriation balances, subject to requisition.....	3,203,160.33
Accounts receivable.....	3,372,255.62
Material and supplies (Table No. 12).....	9,323,072.94
Reequipment loan to Panama R. R. Co.....	1,399,114.61
First mortgage bond loan to Panama R. R. Co.....	1,848,217.50
Public works in Panama and Colon.....	2,674,453.53
Construction of canal (Table No. 5).....	353,234,725.98
Capital additions (Table No. 5).....	2,744,599.24
Equipment (Table No. 11).....	12,577,446.73
Work in progress (Table No. 14).....	220,187.20
Panama Canal property operated by Panama R. R. Co. (Table No. 9).....	1,895,646.33
Assets received from Canal Zone Government.....	364,212.50
Assets received from United States Army.....	175,258.99
Property transferred to other departments United States Government (Table No. 10).....	2,159,923.20
Miscellaneous receipts credited to assets.....	5,241,228.25
Annual payments to Republic of Panama.....	2,250,000.00
Operation and maintenance of canal (Table No. 16).....	45,986,067.03
Unclassified expenses.....	232,976.52
Total.....	453,503,527.94
CREDITS.	
Accounts payable.....	2,697,882.51
Trust funds and security deposits.....	190,755.00
Miscellaneous receipts not deposited in United States Treasury.....	789,284.12
Panama R. R. property operated by Panama Canal (Table No. 18).....	837,547.60
Unclassified credits.....	121,421.66
Reserves (Table No. 13).....	4,285,195.62
Assets received from Canal Zone Government (Table No. 6).....	544,792.37
Assets received from United States Army.....	183,724.99
Reimbursements account public works in Panama and Colon, repaid to appropriations...	396,956.06
Appropriations by the Congress.....	443,455,968.01
Construction.....	\$380,554,949.31
Operating.....	62,352,464.94
Unexpended balances in other appropriations.....	548,553.76
Total.....	453,503,527.94

TABLE NO. 2.—Statement of appropriations by Congress.

Canal construction appropriations:		
Total amount appropriated to June 30, 1921.....	\$387,069,108.31	
Less expended for operation and maintenance.....	6,514,159.00	
Net appropriations for canal construction.....		\$380,554,949.31
Operation and maintenance appropriations:		
Annual payments to Republic of Panama.....	2,500,000.00	
Act of Mar. 4, 1913.....	\$250,000.00	
Act of Apr. 6, 1914.....	250,000.00	
Act of Jan. 25, 1915.....	250,000.00	
Act of Feb. 28, 1916.....	250,000.00	
Act of July 1, 1916.....	250,000.00	
Act of Mar. 3, 1917.....	250,000.00	
Act of Apr. 15, 1918.....	250,000.00	
Act of Apr. 15, 1919.....	250,000.00	
Act of June 4, 1920.....	250,000.00	
Act of Mar. 2, 1921.....	250,000.00	
Maintenance and operation, Panama Canal.....	44,029,790.00	
Sanitation, Canal Zone, Panama Canal.....	4,850,000.00	
Civil government, Panama Canal and Canal Zone.....	4,366,670.00	
Increases of compensation, Panama Canal.....	91,845.94	
Construction funds used for operation and maintenance.....	6,514,159.00	
Total operation and maintenance, Panama Canal.....		62,352,464.94
Unexpended balances in other appropriations:		
Fortifications (allotted to Panama Canal).....	473,781.75	
Army quarters, etc., prior 1920.....	\$258.25	
Army quarters, etc., fiscal year 1920.....	65,705.31	
Army quarters, etc., fiscal year 1921.....	40,000.00	
Cantonment construction.....	204,967.33	
Panama fortifications.....	1,587.94	
Protecting Panama Canal and structures.....	8,926.60	
Sites for seacoast fortifications.....	150,867.04	
Submarine base.....	1,469.28	
Régulating commerce, act of May 20, 1918.....	21,566.80	
Censorship of foreign mails, act of May 20, 1918.....	53,205.21	
Total unexpended, other appropriations.....		548,553.76
Grand total ledger account appropriations by Congress.....		443,455,968.01

Detail of acts covering operation and maintenance appropriations.

	Maintenance and opera- tion.	Sanitation, Canal Zone.	Civil gov- ernment, Panama Canal, Canal Zone.	Increase of com- pensation, Panama Canal.	Total.
Act of Mar. 3, 1915.....	\$5,200,000.00	\$700,000.00	\$540,000.00		\$6,440,000.00
Act of July 1, 1916.....	5,750,000.00	700,000.00	600,000.00		7,050,000.00
Act of June 12, 1917.....	9,000,000.00	700,000.00	700,000.00		10,400,000.00
Act of July 12, 1917.....				\$10,006.22	10,006.22
Act of June 4, 1918.....		150,000.00			150,000.00
Act of July 1, 1918.....	9,000,000.00	900,000.00	750,000.00		10,650,000.00
Act of July 3, 1918.....				16,000.00	16,000.00
Act of Mar. 1, 1919.....				35,018.33	35,018.33
Act of July 19, 1919.....	7,547,939.00	850,000.00	702,000.00		9,099,939.00
Act of Nov. 4, 1919.....			150,000.00		150,000.00
Act of May 29, 1920.....				34,500.00	34,500.00
Act of June 5, 1920.....	7,531,851.00	850,000.00	900,000.00		9,281,851.00
Act of Mar. 1, 1921.....			24,670.00		24,670.00
Total.....	44,029,790.00	4,850,000.00	4,366,670.00	95,524.55	53,341,984.55
Less amount transferred to surplus fund.....				3,678.61	3,678.61
	44,029,790.00	4,850,000.00	4,366,670.00	91,845.94	53,338,305.94
Amount appropriated for construc- tion but used for maintenance and operation and not charge- able against authorized bond issue (act of Aug. 1, 1914, sec. 12), maintenance, and operation prior to July 1, 1915.....					4,289,159.00
Stock of material for maintenance and operation.....					2,225,000.00
Total for operation and main- tenance.....					59,852,464.94
Act of Mar. 4, 1921.....	7,250,000.00	850,000.00	900,000.00		9,000,000.00

TABLE NO. 3.—*Status of authorized bond issue.*

Authorized bond issue.....		\$375,200,900.00
Appropriated for canal construction.....	\$387,069,108.31	
Less amount exempted by law:		
Colliers Ulysses and Achilles.....	\$1,985,552.29	
Coal barges Mamei and Darien.....	2,295,746.57	
Dock No. 6, Cristobal.....	2,093,190.00	
Equipping colliers Ulysses and Achilles.....	250,000.00	
Painting tanks, colliers Ulysses and Achilles.....	44,279.76	
Repairs to steamships Ancon and Cristobal.....	720,000.00	
Expended for operation and maintenance of canal.....	4,289,159.00	
Stock of material and supplies for operation and maintenance of canal.....	2,225,000.00	
	<u>13,902,927.62</u>	
		373,166,180.69
Balance.....		2,034,719.31
Appraised value American legation building, in the city of Panama, exempt from charge to bond issue, act July 1, 1916.....		22,256.00
Balance available for appropriation within limit of cost of canal and authorized bond issue.....		<u>2,056,975.31</u>
Amount appropriated charged to bond issue.....	\$373,166,180.69	
Amount repaid account of public works, Panama and Colon.....	396,956.06	
Expendéd or available for expenditure.....		<u>373,563,136.75</u>

CLASSIFIED STATEMENT (EXPENDED TO JUNE 30, 1921).

Construction of canal:		
Prism excavation.....	\$137,276,036.98	
Locks.....	75,229,985.95	
Dams and spillways.....	17,771,615.81	
Breakwaters.....	9,062,077.94	
Aids to navigation.....	888,887.65	
Auxiliary works:		
Electric power and transmission system.....	6,140,391.04	
Coaling stations.....	5,964,365.94	
Fuel oil plants.....	695,218.39	
Dry docks.....	3,613,030.42	
Wharves, piers, and docks (exclusive of Dock No. 6).....	3,314,854.70	
Playgrounds.....	54,474.41	
Landscape improvements.....	36,280.63	
Water and sewer systems and roads.....	4,615,798.67	
Sanitary fills and ditches.....	793,980.34	
Townsites.....	923,338.07	
Improvements, Cristobal Harbor.....	237,101.43	
Dredging inner harbor and entrance basin.....	3,754,687.43	
Preparatory work Balboa terminal.....	1,808,921.65	
Floating caisson.....	347,868.15	
General items:		
Real estate.....	3,730,862.24	
Purchase from Panama Canal Co.....	38,721,690.16	
Investment, Panama R. R. stock.....	155,818.24	
Concessions from Republic of Panama.....	10,000,000.00	
Relocation Panama R. R.....	9,800,626.46	
Buildings.....	16,164,886.49	
Launch Louise.....	13,500.00	
Canal protection, 1917-18.....	25,236.79	
Equipment, materials and supplies.....	7,878,051.12	
Total.....	<u>359,019,587.10</u>	
Reimbursable and miscellaneous items:		
Public works in cities of Panama and Colon.....	2,674,453.53	
Assets transferred to other departments of the Government.....	2,159,923.20	
Equipment operated by the Panama R. R.....	\$1,895,646.33	
Less Panama R. R. property transferred to canal.....	765,317.32	
	<u>1,130,329.01</u>	
Reequipment loan to Panama R. R.....	1,399,114.61	
First mortgage bond loan to Panama R. R.....	1,848,217.50	
Miscellaneous receipts credited to assets.....	5,241,228.25	
Total.....	<u>14,453,266.10</u>	
Total canal construction to June 30, 1921.....	373,472,853.20	
Allotted for dredging, fiscal year 1922.....	83,043.86	
Outstanding orders.....	7,239.69	
		<u>373,563,136.75</u>

TABLE NO. 4.—*Canal and auxiliary works fiscal year 1921.*

	Con- struction.	Capital additions.	Total.
Construction of canal:			
Prism excavation—			
Gatun to Pedro Miguel.....	\$58,215.96		\$58,215.96
Pedro Miguel to sea.....	27,328.09		27,328.09
Total, prism excavation.....	85,544.05		85,544.05
Gatun locks.....	231,984.16		231,984.16
Pedro Miguel locks.....	280,833.37	\$2,640.00	283,473.37
Miraflores locks.....	201,189.86		201,189.86
Aids to navigation.....	20,268.32	289.53	20,557.85
Dredging—			
Cristobal Harbor.....	74,481.63		74,481.63
Balboa Inner Harbor.....	204,545.47		204,545.47
Total, canal.....	1,013,302.81	2,929.53	1,016,232.34
Auxiliary works:			
Power producing and transmitting system—			
Gatun hydroelectric plant.....		13,103.51	13,103.51
Miraflores steam electric plant.....		376.66	376.66
Substations, transmission and distribution lines.....		111,167.19	111,167.19
Street lighting, townsites.....		1,465.19	1,465.19
Underground duct system, townsites.....		3,024.55	3,024.55
Total, power producing and transmitting system.....		129,137.10	129,137.10
Pacific terminals: Fuel oil plant.....	¹ 4,226.09	26,699.15	22,473.06
Atlantic terminals—			
Fuel oil plant.....	¹ 4,795.21	207,228.35	202,433.14
Docks.....	5,132.26		5,132.26
Total, Atlantic terminals.....	337.05	207,228.35	207,565.40
Permanent townsites: Cristobal.....		15,730.37	15,730.37
Buildings—			
Shops, Balboa.....		18,223.64	18,223.64
Storehouses.....		46,378.62	46,378.62
Hotels and mess halls.....	¹ 600.00		¹ 600.00
Gold quarters.....	3,300.00	51,232.29	54,532.29
Silver quarters.....		18,202.29	18,202.29
Ancon Hospital.....	10,117.21		10,117.21
Asylums.....		3,506.23	3,506.23
Other health department buildings.....	18,535.55	3,074.35	21,609.90
Miscellaneous buildings.....	900.00	86,672.61	87,572.61
Total, buildings.....	32,252.76	227,290.03	259,542.79
Sanitary ditches.....		16,536.90	16,536.90
Landscape improvements.....	1,432.78		1,432.78
Water works system: Other Zone systems, general.....		6,555.13	6,555.13
Roadways, streets, and walks—			
Roadways.....		1,834.22	1,834.22
Streets.....		8,100.67	8,100.67
Walks.....		1,679.24	1,679.24
Total, roadways, streets and walks.....		11,614.13	11,614.13
Real estate—			
Joint land commission expenses.....	1,135.94		1,135.94
Canal construction and flooded areas.....	¹ 15.00		¹ 15.00
Depopulation of the Canal Zone.....	682.00		682.00
Total, real estate.....	1,802.94		1,802.94
Canal protection, 1917 and 1918.....	25,236.79		25,236.79
Total, fiscal year 1921.....	1,155,683.09	643,720.69	1,799,403.78

¹ Indicates credit.

TABLE NO. 5.—*Canal and auxiliary works, total to June 30, 1921.*

	Construction.	Capital additions.	Total canal and auxiliary works.
Construction of canal:			
Prism excavation—			
Gatun to sea.....	\$11, 874, 182. 88		\$11, 874, 182. 88
Gatun to Pedro Miguel.....	107, 067, 900. 67		107, 067, 900. 67
Pedro Miguel to sea.....	18, 333, 953. 43		18, 333, 953. 43
Total prism excavation.....	137, 276, 036. 98		137, 276, 036. 98
Gatun locks.....	35, 958, 177. 42		35, 958, 177. 42
Pedro Miguel locks.....	15, 985, 409. 30	\$2, 640. 00	15, 988, 049. 30
Miraflores locks.....	23, 286, 399. 23		23, 286, 399. 23
Gatun spillway.....	4, 081, 516. 86		4, 081, 516. 86
Miraflores spillway and east dam.....	1, 320, 389. 95		1, 320, 389. 95
Gatun dam.....	9, 823, 140. 60		9, 823, 140. 60
Gatun-Mindilevee.....	140, 635. 01		140, 635. 01
Trinidad River dam.....	66, 385. 47		66, 385. 47
Pedro Miguel dams.....	431, 703. 66		431, 703. 66
Miraflores west dam.....	1, 159, 789. 78		1, 159, 789. 78
La Boca locks and dams (abandoned).....	748, 054. 48		748, 054. 48
Colon east breakwater.....	3, 771, 111. 74		3, 771, 111. 74
Colon west breakwater.....	4, 275, 316. 42		4, 275, 316. 42
Naos Island breakwater.....	1, 015, 649. 78		1, 015, 649. 78
Aids to navigation.....	888, 887. 65	289. 53	889, 177. 18
Dredging Cristobal Harbor.....	237, 101. 43		237, 101. 43
Dredging Balboa inner harbor.....	3, 265, 207. 04		3, 265, 207. 04
Dredging Balboa entrance basin.....	489, 480. 39		489, 480. 39
Total, canal.....	106, 944, 356. 21	2, 929. 53	106, 947, 285. 74
Auxiliary works:			
Power producing and transmitting system (Table No. 20)—			
Gatun hydroelectric plant.....	1, 648, 990. 55	16, 588. 06	1, 665, 578. 61
Miraflores steam-electric plant.....	307, 485. 78	376. 66	307, 862. 44
Substations, transmission and distributing lines.....	3, 700, 591. 52	178, 775. 81	3, 879, 367. 33
Street lighting, townsites.....	90, 033. 26	8, 193. 22	98, 226. 48
Underground duct system, townsites.....	393, 289. 93	18, 547. 77	411, 837. 70
Total power producing and transmitting system.....	6, 140, 391. 04	222, 481. 52	6, 362, 872. 56
Pacific terminals—			
Coaling station.....	2, 284, 568. 35		2, 284, 568. 35
Fuel oil plant.....	389, 900. 60	68, 959. 98	458, 860. 58
Dry dock.....	3, 538, 554. 91		3, 539, 554. 91
Docks.....	3, 184, 964. 31		3, 184, 964. 31
Preparatory work.....	1, 808, 921. 65		1, 808, 921. 65
Total, Pacific terminals.....	11, 207, 909. 82	68, 959. 98	11, 276, 869. 80
Atlantic terminals—			
Coaling station.....	3, 679, 797. 59		3, 679, 797. 59
Fuel-oil plant.....	305, 317. 79	255, 180. 44	560, 498. 23
Dry dock.....	73, 475. 51		73, 475. 51
Docks.....	2, 214, 129. 06		2, 214, 129. 06
Total, Atlantic terminals.....	6, 272, 719. 95	255, 180. 44	6, 527, 900. 39
Gatun dock.....	8, 951. 33		8, 951. 33
Permanent townsites—			
Cristobal.....	122, 040. 71	222, 115. 97	344, 156. 68
Gatun.....	1, 704. 70	71. 86	1, 776. 56
Pedro Miguel.....	91, 709. 06	5, 088. 02	96, 797. 08
Red Tank.....	2, 614. 43		2, 614. 43
Balboa-Ancon.....	582, 063. 04	14, 216. 59	596, 279. 63
La Boca.....	123, 206. 13		123, 206. 13
Total, permanent townsites.....	923, 338. 07	241, 492. 44	1, 164, 830. 51
Buildings, designing, and preliminary expenses—			
Offices—			
Administration, Balboa.....	1, 224, 847. 51		1, 224, 847. 51
Administration, Santa Rosa.....	130, 892. 39		130, 892. 39
Balboa shops.....	238, 553. 94		238, 553. 94
Balboa terminals.....	80, 634. 42		80, 634. 42
Shops—			
Balboa.....	3, 970, 490. 55	30, 025. 56	4, 000, 516. 11
Cristobal.....	163, 203. 14	43, 444. 79	206, 647. 93
Storehouses.....	1, 009, 428. 68	174, 862. 89	1, 184, 291. 57
Hotels and mess halls.....	486, 638. 87	80, 413. 00	567, 051. 87

TABLE NO. 5.—*Canal and auxiliary works, total to June 30, 1921—Continued.*

	Construction.	Capital additions.	Total canal and auxiliary works.
Auxiliary works—Continued.			
Buildings, designing, and preliminary expenses—Con.			
Gold quarters.....	\$4,467,443.75	\$343,347.21	\$4,810,790.96
Silver quarters.....	672,242.62	218,024.12	890,266.74
Ancon Hospital.....	1,705,337.27		1,705,337.27
Colon Hospital.....	255,506.90		255,506.90
Dispensaries.....	161,213.97		161,213.97
Asylums.....	207,994.56	44,791.98	252,786.54
Quarantine stations.....	72,469.36	7,789.12	80,258.48
Medical storehouse.....	25,471.15		25,471.15
Other health department buildings.....	187,593.34	52,814.60	240,407.94
Post offices.....	35,982.62		35,982.62
Courthouses, police and fire stations, jails, etc.....	100,884.23	1,043.27	101,927.50
Schoolhouses.....	482,561.68	9,709.55	492,271.23
Fluviographs.....	13,709.02		13,709.02
Miscellaneous buildings.....	471,786.52	371,923.51	843,710.03
Total buildings.....	16,164,886.49	1,378,189.60	17,543,076.09
Playgrounds, including Balboa grand stand.....	54,474.41		54,474.41
Sanitary fills.....	636,732.11		636,732.11
Sanitary ditches.....	157,248.23	42,458.30	199,706.53
Landscape improvements.....	36,280.63		36,280.63
Waterworks systems—			
Colon-Cristobal.....	585,642.89		585,642.89
Panama-Gamboa.....	1,765,222.58		1,765,222.58
Other Zone systems, general.....	560,876.89	18,139.81	579,016.70
Other Zone systems, townsites.....	131,946.43	1,969.92	133,916.35
Total, waterworks systems.....	3,043,688.79	20,109.73	3,063,798.52
Roadways, streets, and walks—			
Roadways.....	520,118.33	359,911.04	880,029.37
Streets.....	527,283.83	60,396.14	587,679.97
Walks.....	90,161.03	28,752.52	118,913.55
Total roadways, streets, and walks.....	1,137,563.19	449,059.70	1,586,622.89
Zone sewage system—			
General.....	76,457.15	28,864.50	105,321.65
Townsites.....	358,089.54	34,873.50	392,963.04
Total, Zone sewage system.....	434,546.69	63,738.00	498,284.69
Real estate—			
Joint land commission expense.....	356,006.61		356,006.61
Construction and flooded areas.....	891,707.06		891,707.06
Auxiliary works and buildings.....	146,258.94		146,258.94
Depopulation of the Canal Zone.....	2,336,889.63		2,336,889.63
Total real estate.....	3,730,862.24		3,730,862.24
Miscellaneous—			
Floating caisson.....	347,868.15		347,868.15
Relocation Panama R. R.....	9,800,626.46		9,800,626.46
Investment Panama R. R. stock.....	155,818.24		155,818.24
Concessions from Republic of Panama.....	10,000,000.00		10,000,000.00
Purchase from New Panama Canal Co.....	38,721,690.16		38,721,690.16
Presentation of launch Louise to French Government.....	13,500.00		13,500.00
Canal protection, 1917 and 1918.....	25,236.79		25,236.79
Total miscellaneous.....	59,064,739.80		59,064,739.80
Total canal and auxiliary works.....	353,234,725.98	2,744,599.24	355,979,325.22

TABLE NO. 6.—*Detail of assets received from the Canal Zone government.*—The total is \$544,792.37, of which \$451,887.50 are for roads, \$72,115 for school buildings, \$10,500 for waterworks, \$8,000 for sewers, and \$2,289.87 for books and stationery.

TABLE NO. 7.—*Detail of property received from the United States Army at Las Cascadas.*—Total, \$183,724.99, divided as follows: Buildings, \$75,850; roads, \$45,630; buildings erected by Army, \$39,069.99; waterworks, \$12,825; sewer systems, \$10,350.

TABLE NO. 8.—*Detail of Panama Railroad equipment and property operated by Panama Canal.*—Total, \$837,547.60, of which \$373,742.10 are for concrete dock at Balboa, \$286,338.50 for buildings used as quarters, \$79,961.28 for Gamboa gravel plant, \$48,255 for Cristobal roundhouse, \$29,862.50 for floating equipment, \$16,086.72 for rolling stock, and \$3,301.50 for machinery and tools.

TABLE NO. 9.—*Detail of Panama Canal equipment operated by the Panama Railroad.*—The total value of this equipment is \$8,375,768.02. Of this amount \$1,895,646.33 have been transferred on the books and include the steamships *Panama*, *Colon*, *Caribbean* and certain items of floating equipment and railroad rolling stock. Panama Canal equipment operated by the railroad for which no transfer has been made on the books consists of the steamships *Ancon* and *Cristobal*, \$2,164,357.31; the colliers *Achilles* and *Ulysses*, \$2,029,232.05; and the coal barges *Darien* and *Mamei*, \$2,286,532.33. For further details see annual report of the auditor.

TABLE NO. 10.—*Detail of assets transferred to other departments of the United States Government.*—To the Army on the Canal Zone, waterworks, sewer systems, roads, buildings, a tract of land on the Chagres River, and railroad tracks at Fort Amador, total, \$1,739,698.79; to the Alaskan Engineering Commission, railroad rolling stock and construction material, \$395,965.16; to State Department on account of legation building, Panama City, \$22,256; Colon boathouse to Army and Navy on Canal Zone, \$2,003.25; grand total, \$2,159,923.20. The details of this statement will be found in the annual report of the auditor.

TABLE NO. 11.—*Detail of Panama Canal equipment.*—Floating equipment, \$11,193,728.09; other equipment, such as trucks, cranes, road rollers, etc., \$611,482.82; machinery and tools, \$772,235.82; a grand total of \$12,577,446.73. Of this amount there were added during the fiscal year 1921, for the coal barges *Mamei* and *Darien*, \$2,286,532.33; for the dredge *Culebra*, returned by the Panama Railroad, \$250,000; for machinery and tools, \$206,899.72; for miscellaneous equipment, \$28,781.86. For complete statement see annual report of the auditor.

TABLE NO. 12.—*Detail of material and supplies.*—This gives the amount in various stores on the Isthmus. The net book value of materials and supplies is \$9,323,072.94. For complete statement see auditor's report.

TABLE NO. 13.—*Detail of reserves for gratuity, depreciation, and repairs.*—A reserve for leave earned, known as "gratuity," for depreciation of plant, and for repairs to equipment and plant is made from revenues of the business operations of the divisions that do a large amount of such work. This amounted on June 30, 1921, to the following: Gratuity, \$717,037.09; depreciation, \$2,877,967.49; repairs, \$690,191.04; total, \$4,285,195.62. For detail of reserves see annual report of the auditor.

TABLE NO. 14.—*Detail of work in progress.*—This statement shows that the mechanical division had in progress at the end of the fiscal year \$171,835.51 worth of work, and other divisions \$48,351.69. A detail of this statement will be found in the annual report of the auditor.

TABLE No. 15.—Statement of overhead expenses.

	Expenses, fiscal year 1920.		Expenses, fiscal year 1921.	
	Gross.	Net.	Gross.	Net.
Civil government:				
Civil affairs—				
Administration.....	\$5,339.91	\$5,339.91	\$6,364.04	\$6,199.79
Posts.....	171,516.54	165,410.25	203,221.82	192,549.91
Customs.....	36,258.16	34,705.39	36,909.47	35,504.27
Estates.....	2,731.25	2,731.25	3,106.59	3,106.59
Total civil affairs.....	215,845.86	208,186.80	249,601.92	237,360.56
Schools.....	170,481.42	164,879.34	246,672.67	241,039.31
Fire protection.....	91,063.58	89,307.81	113,025.87	112,681.88
Police and prisons.....	335,436.66	292,559.46	388,095.97	338,300.88
District court.....	22,910.51	22,910.51	22,702.35	22,696.32
Magistrate courts.....	14,535.07	14,535.07	16,675.79	16,390.28
District attorney.....	7,975.22	7,975.22	9,235.91	9,235.91
Canal Zone marshal.....	8,260.01	8,260.01	9,068.17	9,022.32
Municipal expenses.....	44.21	44.21	111.79	111.79
Total civil government.....	866,552.54	808,658.43	1,055,190.44	936,839.25
Less credits.....	57,894.11		68,351.19	
Health department:				
Administration.....	22,291.37	22,291.37	21,776.03	21,776.03
Medical storehouse.....	15,349.41	15,349.41	16,409.20	16,409.20
Ancon Hospital.....	578,439.70	124,302.60	622,669.19	294,011.37
Colon Hospital.....	99,938.44	59,180.38	120,559.86	76,893.52
Santo Tomas Hospital.....	13,566.13	12,918.66	13,773.65	13,073.05
Palo Seco leper asylum.....	35,836.89	18,740.03	36,233.28	25,078.94
Corozal farm and insane asylum.....	125,494.16	63,516.77	132,794.45	72,332.75
Other hospitals and dispensaries.....	44,875.37	28,617.56	54,807.53	22,836.64
Quarantine service.....	90,388.63	52,267.70	85,130.31	50,965.23
Sanitation—				
Panama.....	70,768.60	60,774.17	82,900.67	72,307.24
Colon.....	59,668.00	45,923.76	63,574.50	44,010.99
Canal Zone.....	143,980.52	128,253.74	138,635.80	117,334.31
Street cleaning and garbage disposal—				
Panama.....	87,328.36	7,340.10	91,497.67	98,212.78
Colon.....	50,703.59	22,873.65	70,379.14	31,845.22
Total health department.....	1,438,629.17	662,349.99	1,551,141.28	957,087.27
Less credits.....	776,279.27		594,054.01	
Administration:				
Executive office—				
Executive.....	44,161.93	42,252.93	54,951.67	48,344.27
Record bureau.....	57,527.82	46,116.02	71,737.04	59,122.32
Personnel bureau.....	29,293.94	24,475.97	36,417.78	29,073.78
Correspondence bureau.....	39,615.19	28,317.30	41,526.78	31,746.78
Property and requisition bureau.....	31,590.78	22,693.58	34,656.52	27,312.52
Statistics bureau.....	15,129.53	12,329.38	19,988.09	16,388.09
General bureau.....	55,253.46	47,594.91	52,492.08	40,423.20
Bureau of payrolls.....	97,009.44	59,409.80	117,140.37	64,562.24
Operation of official motor cars.....	21,945.22	3,086.65	22,915.53	3,738.29
Bureau of clubs and playgrounds.....	217,921.42	174,955.93	270,235.93	206,791.58
Executive miscellaneous.....	4,542.79	4,221.57	13,679.51	13,671.26
The Canal Record.....	12,199.31	12,093.25	17,336.02	17,207.10
Cables and radiograms.....	9,561.10	9,180.40	7,402.90	7,179.67
Land office.....	13,377.22	4,377.22	5,767.15	5,761.72
Legal expenses.....	11,030.15		1,280.84	1,278.18
Shipping commissioner.....	33,264.95	33,236.78	39,238.31	39,238.31
Total.....	693,424.25	518,168.39	806,766.52	611,839.31
Less credits.....	175,255.86		194,927.21	
Engineer of maintenance:				
Office engineer.....	54,180.11	19,932.17	38,892.10	15,897.90
Meteorology and hydrography.....	36,793.67	35,077.24	38,852.71	38,761.51
Surveys.....	43,993.31	38,096.63	45,061.19	39,033.15
Total.....	134,967.09	93,106.04	122,806.00	93,692.56
Less credits.....	41,861.05		29,113.44	

TABLE NO. 15.—*Statement of overhead expenses—Continued.*

	Expenses, fiscal year 1920.		Expenses, fiscal year 1921.	
	Gross.	Net.	Gross.	Net.
Accounting department:				
Accounting office.....	\$404,090.11	\$249,700.07	\$466,445.87	\$263,110.74
Paymaster's office.....	52,430.83	42,350.96	52,011.51	40,527.49
Collector's office.....	43,243.22	32,585.60	48,307.43	36,164.14
Total.....	499,764.16	324,636.63	566,764.81	339,802.37
Less credits.....	175,127.53	.....	226,962.44	.....
Washington office:				
Assistant auditor's office.....	41,819.03	41,804.50	44,343.08	44,312.43
Disbursing clerk's office.....	11,923.65	11,924.36	12,578.33	12,571.52
General bureau.....	70,368.71	70,088.12	72,701.30	72,346.80
Purchasing expenses.....	222,892.63	221,756.00	230,322.08	229,334.19
Total.....	347,009.02	345,572.98	359,944.79	358,564.94
Less credits.....	1,436.04	.....	1,379.85	.....
Municipal engineering:				
Operation and maintenance of waterworks.....	449,595.60	155,161.11	460,736.20	138,948.99
Repairs to sewer system.....	24,966.88	24,966.88	18,990.75	18,990.75
Repairs to roads.....	136,299.56	136,299.56	109,534.49	109,534.49
Total.....	610,862.04	316,427.55	589,261.44	267,474.23
Less credits.....	294,434.49	.....	321,787.21	.....
Electrical division: Lights—Streets, lodge halls, and churches.....	14,609.73	14,609.73	16,196.91	16,196.91
Supply department:				
Maintenance and care of administration building.....	40,064.39	40,064.39	59,566.42	59,566.42
Operation of storehouses.....	713,528.09	659,528.09	769,870.43	715,870.43
Repairs to storehouses.....	2,755.79	2,755.79	4,058.43	4,058.43
Handling freight on docks.....	16,464.01	16,464.01	8,385.91	8,385.91
Operation of quarters.....	557,835.67	337,008.55	874,217.55	612,976.62
Repairs to quarters.....	374,194.09	374,194.09	455,052.69	455,052.69
Repairs to others buildings.....	1,302.22	1,302.22	3,778.70	3,738.58
Aneon nursery.....	5,229.71	1,266.23	5,595.17	.....
Store stock losses and adjustments.....	28,426.10	28,426.10	5,633.00	5,633.00
Loss on corral and motor-truck operations.....	.....	.....	49,840.07	49,840.07
Total.....	1,739,800.07	1,459,477.01	2,235,998.37	1,915,122.15
Less credits.....	280,323.06	.....	320,876.22	.....
Miscellaneous:				
Transportation of employees on Isthmus.....	141,603.68	141,603.68	141,300.09	141,300.09
Recruiting and repatriating.....	51,554.96	51,554.96	57,068.21	57,068.21
Compensation to injured employees.....	1,073.95	1,073.95	416.62	416.62
Payments to deported alien cripples.....	1,200.00	1,200.00	1 350.00	1 350.00
Total.....	195,432.59	195,432.59	198,434.92	198,434.92
Recapitulation:				
Grand total, administration.....	4,235,868.95	3,267,430.92	4,896,173.76	3,801,127.39
Less credits.....	968,438.03	.....	1,095,046.37	.....
Total overhead expenses.....	6,541,050.66	4,738,439.25	7,502,505.48	5,745,053.91
Less credits.....	1,802,611.41	.....	1,757,451.57	.....
Distribution:				
Business operations.....	.....	1,239,639.22	.....	939,952.13
Construction of canal.....	.....	70,878.61	.....	34,882.39
Capital additions.....	.....	103,754.32	.....	59,172.40
Operation and maintenance of canal.....	.....	3,324,167.10	.....	4,711,046.99
Total.....	.....	4,738,439.25	.....	5,745,053.91

¹ Credit.

TABLE NO. 16.—Panama Canal operation and maintenance to June 30, 1921.

	Fiscal year 1920.	Fiscal year 1921.	Total to date.
Marine division:			
Admeasurement of vessels.....	\$31,385.91	\$41,167.46	\$142,703.52
Local inspection.....	7,292.82	9,019.88	37,627.70
Aids to navigation.....	122,794.31	270,121.38	780,172.68
Pilotage.....	188,535.36	248,665.54	868,190.98
Operation of harbor tugs, balance.....	58,555.45	116,739.94	413,703.06
Operation of port captains' offices, balance.....	47,999.86	67,926.69	232,823.47
Assisting vessels through Cut.....	7,788.60	7,266.95	21,173.58
Total marine division.....	464,352.31	760,907.84	2,496,394.99
Locks, operation and maintenance:			
Gatun locks:			
Superintendence.....	29,154.46	42,072.09	173,835.25
Operation.....	200,021.35	241,535.35	1,021,634.80
Maintenance.....	143,849.71	817,048.20	1,195,758.59
Total Gatun locks.....	373,025.52	600,655.64	2,391,228.64
Gatun spillway.....	6,535.37	4,664.48	80,796.36
Pedro Miguel locks:			
Superintendence.....	19,620.70	25,857.93	138,014.78
Operation.....	174,494.38	188,521.15	805,868.82
Maintenance.....	84,434.88	126,765.66	660,616.51
Total Pedro Miguel locks.....	278,549.96	341,144.74	1,604,500.11
Pedro Miguel dams.....			168.96
Miraflores locks:			
Superintendence.....	19,731.61	22,992.86	138,747.95
Operation.....	190,935.95	239,416.95	1,022,020.56
Maintenance.....	113,354.13	111,373.21	773,823.63
Total Miraflores locks.....	324,021.69	373,783.02	1,934,592.14
Miraflores spillway and east dam.....	1,323.49	289.30	19,009.16
Miraflores west dam, maintenance.....			832.37
Total locks, operation and maintenance.....	983,456.03	1,320,537.18	6,031,127.74
Dredging:			
Atlantic entrance.....	9,017.14	134,351.23	332,720.51
Gatun Lake.....	6,293.82	24,864.08	44,131.55
Gaillard Cut.....	1,116,835.70	1,575,313.68	12,591,870.42
Miraflores Lake.....	23.95	82,617.31	167,919.22
Pacific entrance.....	290,835.16	342,174.27	1,508,800.05
Atlantic Inner Harbor.....		54,775.25	54,775.25
Pacific Inner Harbor.....	188,354.01	98,851.72	287,205.73
Total dredging.....	1,611,359.78	2,312,947.54	14,987,422.73
Gatun dam, maintenance.....	21,631.28	56,311.85	188,746.92
Removal of floating obstructions.....	33,063.09	54,344.90	220,635.65
Gatun-Mindi levee, maintenance.....		371.43	31,697.47
Colon west breakwater, maintenance.....			81,523.46
Naos Island Breakwater, maintenance.....			14,193.55
Damage to vessels in locks.....	7,243.51	6,416.91	26,329.35
Damage to vessels in canal.....	7,541.10	4,968.66	51,218.32
Operation of floating derricks.....	46,874.32	48,501.78	625,749.35
Maintenance of transportation tracks.....	46,127.42	46,066.72	312,171.06
Dry excavation, Rio Grande.....			37,606.99
Shop expense, Balboa, balance.....			19,158.55
Capital losses.....	1,363.95		126,095.89
Capital replacements.....	1,092.54	5,878.34	28,781.15
Loss on business operations.....			61,823.17
Total operation and maintenance.....	3,224,105.33	4,617,253.15	25,340,676.34
Proportion of overhead expenses.....	3,324,167.10	4,711,046.99	20,645,390.69
Total.....	6,548,272.43	9,328,300.14	45,986,067.03
Revenues:			
Tolls.....	8,493,082.56	11,261,919.31	44,565,500.98
Interest, licenses, taxes, fees, fines, etc.....	203,102.88	213,986.19	978,880.75
Profit on business operations.....	239,686.13	564,211.20	922,410.25
Total revenues.....	8,935,871.57	12,040,116.70	46,466,791.98
Revenues in excess of expenses.....	2,387,599.14	2,711,816.56	480,724.95

TABLE NO. 17.—*Statement of profit and loss on business operations for fiscal year ended June 30, 1921.*

	Cost.	Revenue.	Profit or loss.
DEPARTMENT OF OPERATION AND MAINTENANCE.			
Construction and repairs.....	\$2,124,625.73	\$2,165,467.58	\$40,841.85
Shopwork.....	4,610,376.07	4,513,616.41	¹ 96,759.66
Electric work.....	425,814.46	427,946.75	2,132.29
Electric current.....	177,698.73	183,301.26	5,602.53
Train service and use of rolling equipment.....	653.69	¹ 1,363.80	¹ 2,017.49
Tug service.....	507,978.53	353,202.70	¹ 154,775.83
Lighthouse tender "Favorite".....	71,617.57	71,617.57	
Service of other floating equipment.....	96,782.64	85,824.09	¹ 10,958.55
Pilotage.....	80,880.92	139,859.00	58,978.08
Wharfage.....	47,479.35	35,439.59	¹ 12,039.76
Sales of water.....	268,163.76	261,575.20	¹ 6,588.56
Panama waterworks.....	128,563.08	128,563.08	
Panama pavements.....	3,635.21	3,635.21	
Colon waterworks.....	69,066.90	69,066.90	
Colon pavements.....	10,411.64	10,411.64	
Handling lines at locks.....	110,156.22	86,419.00	¹ 23,737.22
Handling lines at docks.....	5,492.77	2,006.00	¹ 3,486.77
Steamship inspection.....	1,698.23	2,828.10	1,129.87
Dredging.....	54,305.87	54,305.87	
Minor services, supplies and property.....	32,074.88	33,229.52	1,154.64
Dry dockage—Balboa.....	125,014.12	353,358.84	228,344.72
Dry dockage—Cristobal.....	18,069.44	33,252.95	15,183.51
Total, department of operation and maintenance.....	8,970,559.81	9,013,563.46	43,003.65
SUPPLY DEPARTMENT.			
Subsistence:			
Hotel Tivoli.....	222,207.41	231,096.73	8,889.32
Hotel Aspinwall.....	82,987.48	68,873.36	¹ 14,114.12
Line hotels.....	780,672.14	701,794.48	¹ 78,877.66
Messes.....	101,256.79	88,772.00	¹ 12,484.79
Minor services, supplies and property.....	9.53	3,173.32	3,163.79
Total, subsistence.....	1,187,133.35	1,093,709.89	¹ 93,423.46
QUARTERMASTER.			
Material from stock.....	2,036,469.33	2,067,443.60	30,974.27
Fuel oil.....	373,839.61	892,715.87	518,876.26
Rock, sand, gravel, and screenings.....	23,464.89	23,464.89	
Printing and binding.....	62,172.72	63,100.94	928.22
Corral.....	176,546.57	177,058.48	511.91
Rental of gold quarters.....	1,558.31	1,558.31	
Rental of silver quarters.....	161,055.84	139,530.46	¹ 21,525.38
Garage rental.....	4,901.02	10,551.57	5,650.55
Ancon nursery.....	5,595.17	7,767.22	2,172.05
Handling fuel oil.....	143,981.10	184,209.56	40,228.46
Operation of stores.....	54,274.40	54,274.40	
Operation of quarters.....	167,400.00	167,400.00	
Minor services, supplies and property.....	122,402.99	129,740.84	7,337.85
Las Cascadas, silver settlement.....	4,392.07	4,392.07	
Total, quartermaster.....	3,338,054.02	3,923,208.21	585,154.19
ACCOUNTING DEPARTMENT.			
Lost metal checks.....	31.67	685.50	653.83
Cablegrams.....	956.51	1,278.35	321.84
Service to Panama R. R. Co.....	282,458.04	282,458.04	
Safety deposit boxes.....	580.00	580.00	
Minor services, supplies and property.....	260.48	260.48	
Total, accounting department.....	284,286.70	285,262.37	975.67
HEALTH DEPARTMENT.			
Ancon Hospital:			
Fees.....	318,390.94	299,572.52	¹ 18,818.42
Mess.....	18,654.44	16,958.58	¹ 1,695.86
Burials.....	6,647.16	6,647.16	
Miscellaneous.....	4,590.27	4,590.27	
Colon Hospital:			
Fees.....	40,667.62	38,698.88	¹ 1,968.74
Mess.....	5,108.92	4,644.47	¹ 464.45
Miscellaneous.....	346.20	346.20	
Palo Seco Asylum.....	11,745.59	12,244.75	499.16
Line dispensaries.....	32,476.73	32,476.73	
Quarantine:			
Subsistence.....	22,029.24	22,772.73	743.49
Other charges.....	14,808.88	14,808.88	

¹ Loss

TABLE No. 17.—*Statement of profit and loss on business operations for fiscal year ended June 30, 1921—Continued.*

	Cost.	Revenue.	Profit or loss.
HEALTH DEPARTMENT—continued.			
Sanitation:			
Panama.....	\$11,684.86	\$11,684.86	.....
Colon.....	21,255.95	21,255.95	.....
Zone.....	22,047.11	22,047.11	.....
Street cleaning, garbage collection, disposal, and incineration:			
Panama.....	49,938.42	49,938.42	}.....
Colon.....	157,325.05	157,325.05	
.....	41,921.07	41,921.07	
Corozal Hospital:			
Produce.....	20,245.07	20,245.07	.....
Burials.....	644.50	644.50	.....
Insane asylum.....	46,736.15	75,045.28	\$28,309.13
Sales from medical store.....	33,901.49	40,420.52	6,519.03
Sales of garbage cans.....	716.50	716.50	.....
Total, health department.....	667,232.06	680,355.40	13,123.34
CIVIL GOVERNMENT.			
School tuition.....	4,954.50	4,954.50	.....
Sale of school books.....	849.96	845.35	¹ 4.61
Police service.....	45,299.73	45,299.73	.....
Postal service.....	8,021.24	8,021.24	.....
Minor services, supplies and property.....	5,014.92	5,067.09	52.17
Inspection of household goods.....	1,000.00	1,000.00	.....
Total, civil government.....	65,140.35	65,187.91	47.56
EXECUTIVE DEPARTMENT.			
Service to Panama R. R. Co.....	110,648.00	110,648.00	.....
Photographs and prints.....	1,133.59	1,133.59	.....
Motor car service.....	8,582.00	8,582.00	.....
Minor services, supplies and property.....	413.48	413.48	.....
Canal record.....	128.92	257.84	128.92
Sale of annual reports.....	2.00	2.00	.....
Total, executive department.....	120,907.99	121,036.91	128.92
MISCELLANEOUS.			
Land rental.....	6,979.09	12,293.06	5,313.97
Building rental.....	2,504.40	6,242.47	3,738.07
Equipment rental.....	1,709.44	1,768.25	58.81
Pier rental.....	22,667.11	28,128.63	5,461.52
Boathouse rental.....	144.89	731.35	586.46
Duct line rentals.....	786.67	829.17	42.50
Total, miscellaneous.....	34,791.60	49,992.93	15,201.33
Grand total.....	14,668,105.88	15,232,317.08	564,211.20

¹ Loss.TABLE No. 18.—*Detail of miscellaneous receipts, United States funds.*

	Fiscal year 1921.	Total to date.
Receipts involving no appropriation expenditures:		
Subsidies from Panama Railroad Co.....		\$631,875.00
Dividends on Panama Railroad stock.....		344,945.00
Interest on reequipment loan.....		320,799.11
Interest on first-mortgage bond loan.....		152,395.16
Interest on public works, Panama and Colon.....	\$41,264.63	443,535.12
Interest on Zone water supply systems, proportion.....	15,796.36	139,787.45
Interest on bank balances.....	25,000.00	98,147.30
Miscellaneous rentals.....		243,243.03
Overages.....	2.48	523.30
Forfeitures.....		807.82
Salvaging steamship Moselle.....		210.50
Miscellaneous.....		6,496.54
Total.....	82,063.47	2,382,765.33

TABLE NO. 18.—*Detail of miscellaneous receipts, United States funds—Continued.*

	Fiscal year 1921.	Total to date.
Receipts involving expenditures from appropriations:		
Not credited to assets—		
Capital cost—		
Panama waterworks and sewers.....	\$18,170.38	\$102,328.41
Panama pavements.....	11,746.80	82,221.99
Colon waterworks and sewers.....	13,189.14	91,513.03
Colon pavements.....	13,036.06	86,970.03
Tolls.....	11,261,919.31	44,565,500.98
Licenses and taxes.....	18,564.12	86,940.82
Court fees and fines.....	39,507.53	141,646.25
Postal receipts.....	129,826.29	645,871.56
Miscellaneous, Canal Zone.....	1,088.25	6,274.82
Profit on business operations.....	564,211.20	922,410.25
Total.....	12,071,259.08	46,731,678.14
Credits to assets—		
Sale of property.....		850,500.11
Sale of French materials and equipment.....	10,067.34	134,060.03
Sale of Panama Canal building, City of Panama.....		80,000.00
Sale of water.....		255.43
Mess accounts.....		46,879.48
Hospital receipts.....		79,992.68
Quarantine receipts.....		24,900.53
Laundry receipts.....		7,382.01
Rental of lands and buildings.....		41,427.24
Rentals, miscellaneous.....		137,824.99
Telegraph and telephone receipts.....		3,547.35
Hotels and messes.....		758,470.34
Hotel coupon books.....		32,238.28
Corral receipts.....		8,628.56
Labor furnished Panama Railroad Co.....		180,336.97
Other labor furnished.....		27,449.55
Repayments, equipment loan.....		1,387,714.92
Repayments, first-mortgage bond loan.....		300,000.00
Sale of Panama Railroad stock.....		1,300.00
Miscellaneous.....	100.00	93,905.47
Sale of construction material and equipment.....	15,920.61	1,032,122.79
Forfeitures by contractors.....		12,293.52
Total.....	26,087.95	5,241,228.25
Grand total.....	12,179,410.50	54,355,671.72
Miscellaneous receipts deposited in United States Treasury.....		53,566,387.60
Cash on hand June 30, 1921.....		121,773.13
Amount of water rentals, Panama and Colon—		
Credited to miscellaneous receipts.....	946,356.03	
Deposited as miscellaneous receipts.....	862,703.02	
		83,653.01
Profit on business operations, 1921, not transferred to miscellaneous receipts.....		564,211.20
Unpaid bills.....		19,646.78
Total.....		54,355,671.72

TABLE NO. 19.—*Comparison of expenses and revenues directly applicable to transiting vessels.*

Fiscal year.	Maintenance and operation, including proportion of overhead.	Tolls.	Interest, licenses, taxes, fees, etc.	Profit on business operations.	Total revenues.	Excess of revenues over expenses.
1914.....	\$166,030.91	\$14,618.68			\$14,618.68	¹ \$151,412.23
1915.....	4,123,128.09	4,343,383.69			4,343,383.69	220,255.60
1916.....	6,999,750.15	2,399,830.42	\$146,813.52	\$11,898.44	2,558,542.38	¹ 4,441,207.77
1917.....	6,788,047.60	5,631,781.66	137,189.38	39,427.66	5,808,398.70	¹ 979,648.90
1918.....	5,920,342.94	6,264,765.71	140,918.01	6,159.56	6,411,843.28	491,500.34
1919.....	6,112,191.77	6,156,118.95	136,870.77	61,027.26	6,354,016.98	241,822.21
1920.....	6,548,272.43	8,493,082.56	203,102.88	239,686.13	8,935,871.57	2,387,599.14
1921.....	9,328,300.14	11,261,919.31	213,986.19	564,211.20	12,040,116.70	2,711,816.56
Total.....	45,986,067.03	44,565,500.98	978,880.75	922,410.25	46,466,791.98	480,724.95

¹ Denotes expenses in excess of revenues.

Comparison of expenses and revenues from business operations.

Fiscal year.	Expenditures.	Revenues.	Profit or loss.
1914.....	\$695,720.71	\$690,298.32	¹ \$5,422.39
1915.....	2,191,475.70	2,135,074.92	¹ 56,400.78
1916.....	6,476,623.17	6,488,521.61	11,898.44
1917.....	7,540,160.78	7,579,588.44	39,427.66
1918.....	10,317,912.35	10,324,071.91	6,159.56
1919.....	13,623,853.92	13,684,881.18	61,027.26
1920.....	14,465,685.69	14,705,371.82	239,686.13
1921.....	14,668,105.88	15,232,317.08	564,211.20
Covered into Treasury as miscellaneous receipts.....	.....	.....	922,410.25
Charged to operation and maintenance of canal.....	.....	.....	61,823.17

¹ Loss.TABLE NO. 20.—*Detailed cost power producing and transmitting system, fiscal year 1921, and to June 30, 1921.*

	Fiscal year 1921.	To June 30, 1921.
Gatun hydroelectric power plant:		
Building.....	.....	574,912.79
Excavation.....	.....	54,862.07
Operating machinery.....	11,912.28	783,452.18
Total division cost.....	11,912.28	1,413,227.04
Miraflores steam-electric power plant:		
Building and site.....	.....	233,629.74
Operating machinery.....	342.42	27,791.32
Total division cost.....	342.42	261,421.06
Power system:		
Transformer substations—		
Balboa.....	.....	291,087.76
Cristobal.....	852.25	333,013.23
Gamboa.....	.....	23,775.03
Gatun.....	40,798.01	501,751.26
Gold Hill.....	.....	1,696.77
Miraflores.....	1,621.38	361,568.07
Transmission line.....	.....	1,108,692.59
Distribution and duct system.....	57,789.44	552,926.00
Underground duct system, townsites.....	2,749.60	361,929.80
Street lighting, townsites.....	1,331.99	85,033.98
Total division cost.....	105,142.67	3,621,474.49
Total division cost, power producing and transmitting system.....	117,397.37	5,296,122.59
Charged to—		
Canal construction.....	.....	5,093,866.66
Capital additions.....	117,397.37	202,255.93
Total.....	117,397.37	5,296,122.59

TABLE NO. 21.—*Detail of cost of production and distribution of electric current for fiscal years 1920 and 1921.*

	Fiscal year 1920.	Fiscal year 1921.
Gatun hydroelectric power plant:		
Operation and maintenance.....	\$48,771.71	\$62,123.85
Reserve for depreciation.....	51,480.00	51,080.00
Reserve for repairs.....	1,050.00	1,395.00
Total cost.....	101,301.71	114,598.85
Kilowatt hours.....	46,961.814	59,376.112
Unit cost.....	\$0.0022	\$0.0019
Miraflores steam electric power plant: ¹		
Operation and maintenance.....	\$142,100.61	\$91,127.86
Reserve for depreciation.....	25,800.00	25,600.00
Reserve for repairs.....	570.00	765.00
Total cost.....	168,470.61	117,492.86
Kilowatt hours.....	8,338,280	524,014
Unit cost.....	\$0.0202	\$0.2242
Total cost, both plants.....	\$269,772.32	\$232,091.71
Total kilowatt hours.....	55,300,094	59,900,126
Average cost per kilowatt hour.....	\$0.0049	\$0.0039
Operation of substations:		
Cristobal.....	\$18,241.11	\$24,500.95
Gatun.....	21,510.02	26,168.07
Gamboa.....		1,651.38
Miraflores.....	23,323.42	27,454.24
Balboa.....	19,071.58	24,728.97
Reserve for depreciation.....	52,620.00	52,620.00
Reserve for repairs.....	675.00	900.00
Total cost.....	135,441.13	158,023.61
Transmission lines:		
Inspection and maintenance.....	16,797.25	\$34,703.32
Reserve for depreciation.....	27,000.00	27,000.00
Reserve for repairs.....	2,205.00	2,940.00
Total cost.....	46,002.25	64,643.32
Distribution lines:		
Inspection and maintenance.....	\$31,161.59	\$39,414.57
Reserve for depreciation.....	38,100.00	38,100.00
Total cost.....	69,261.59	77,514.57
Grand total cost distributed power.....	520,477.29	532,273.21
Total kilowatt hours.....	55,300,094	59,900,126
Unit cost.....	\$0.0094	\$0.0089
House lighting:		
Maintenance of house wiring and lamp renewals.....	\$53,000.06	\$63,469.76
Kilowatt hours.....	13,986,878	16,112,051
Unit cost.....	\$0.0038	\$0.0039
Total unit cost lighting, including power.....	\$0.0132	\$0.0128

¹ Miraflores steam power plant is generally operated as a reserve generative station. In fiscal year 1920 this station operated under load for the dry season period from March to April, inclusive. During the fiscal year 1921, peak loads were carried throughout the year which could not be generated at the hydroelectric station, and during the months of October and November, picked up additional load account of autotransformer failure at the hydroelectric station.

TABLE NO. 22.—*Detailed cost of production of water per 1,000 gallons.*—This statement shows that the unit cost for Ancon-Balboa-Panama system in the fiscal year was 7.68 cents per 1,000 gallons; Gatun system, 13.61 cents per 1,000 gallons; Cristobal-Colon system, 5.14 cents per 1,000 gallons. The total quantity of water delivered by the municipal water systems was 7,434,775,000 gallons. For details of this statement see annual report of the auditor.

TABLE NO. 23.—*Cost of housing employees, fiscal years 1920 and 1921.*

	Fiscal year 1920.	Fiscal year 1921.
Repairs to buildings.....	\$374,194.09	\$455,052.69
Fuel; coal and kindling.....	103,941.45	127,628.46
Grass cutting.....	37,084.57	38,756.63
Disposal of garbage.....	24,536.92	44,485.23
Repairs to furniture.....	54,704.65	101,409.05
Repairs to stoves.....	23,020.50	27,649.91
Corral service.....	55,024.66	59,280.37
Janitor service.....	99,396.97	109,504.45
Utility service.....	39,877.09	39,841.20
Care of grounds.....	89,246.81	87,700.37
Mattress factory.....	15,572.25	¹ 1,449.33
Electric lighting.....	93,038.08	110,600.05
Division expense.....	48,685.75	50,539.43
Total.....	1,058,323.79	1,250,998.51
Equipment and tools.....	12,399.18	16,707.74
Furniture, mattresses, and stoves.....	41,591.85	60,203.21
Install hot-water tanks in gold bachelor quarters.....	7,032.37	1,360.78
Total division cost.....	1,119,347.19	1,329,270.24
Less:		
Cost of housing Panama Railroad employees.....	140,600.00	167,400.00
Expense of silver rented quarters.....	79,600.00	92,400.00
Expense of gold rented quarters.....	521.67	1,440.93
Total.....	220,721.67	261,240.93
Net cost of housing Panama Canal employees.....	898,625.52	1,068,029.31

¹ Credit.TABLE NO. 24.—*Dredging excavation, fiscal year 1921—Construction.*

Detail of charges.	Unit costs.		
	Gaillard Cut.	Pacific entrance.	Balboa Inner Harbor.
Operation, dipper dredges.....	\$0.1117	\$0.2062	\$0.1534
Repairs, dipper dredges.....	.2483	.3206	.2246
Depreciation, dipper dredges.....	.0105	.0339	.0244
Operation, suction dredges.....		.0826	.0671
Repairs, suction dredges.....		.0233	.0230
Depreciation, suction dredges.....		.0042	.0042
Operation, tugs and scows.....	.1744	.1550	.1098
Repairs, tugs and scows.....	.5398	.2271	.1461
Depreciation, tugs and scows.....	.0243	.0143	.0094
Operation, miscellaneous floating equipment.....	.0227	.0118	.0324
Repairs, miscellaneous floating equipment.....	.0165	.0068	.0110
Depreciation, miscellaneous floating equipment.....	.0021	.0011	.0028
Operation, drill barges.....	1.0247		1.8624
Repairs, drill barges.....	.6914		.2978
Depreciation, drill barges.....	.0092		.0204
Dikes.....		.0174	.0019
Pipe lines.....			.0165
Surveys.....		.0343	.0122
Division expense.....	.4448	.3342	.2100
Total division unit cost.....	2.1169	1.2612	1.1157
Amount expended, including canal overhead.....	58,215.96	27,328.09	¹ 181,332.15
Amount expended, division cost.....	52,923.60	24,843.72	164,847.41
Quantities excavated (cubic yards):			
Dipper dredges—			
Earth.....		2,500	101,750
Rock.....	25,000	15,200	29,000
Suction dredges—			
Earth.....			17,000
Rock.....		2,000	
Total.....	25,000	19,700	147,750

¹ General ledger shows a total of \$204,545.47. The difference represents charges carried in "Work in progress" for work performed in fiscal year 1920.

Grand total yardage removed.....	192,450
Grand total amount expended, division cost.....	\$242,614.73
Average cost per cubic yard.....	\$1.2606

TABLE NO. 24.—*Dredging excavation, fiscal year 1921—Construction—Continued.*

PREVIOUS FISCAL YEAR.

Detail of charges.	Unit costs.	
	Pacific entrance.	Balboa Inner Harbor.
Total division unit cost.....	\$0.1385	\$0.5034
Amount expended, including canal overhead.....	2,710.09	34,916.25
Amount expended, division cost.....	2,463.72	31,742.04
Quantities excavated (cubic yards):		
Dipper dredges—		
Earth.....		37,550
Rock.....		10,000
Suction dredges—		
Earth.....	17,800	15,500
Total.....	17,800	63,050
Grand total yardage removed.....		80,850
Grand total amount expended, division cost.....		\$34,205.76
Average cost per cubic yard.....		\$0.4231

TABLE No. 25.—*Dredging excavation, fiscal year 1921—Maintenance.*

Detail of charges.	Unit costs.					
	Gaillard Cut.	Pacific entrance.	Balboa Inner Harbor.	Atlantic entrance.	Cristobal Inner Harbor.	Catun Lake.
Operation, dipper dredges.....	\$0.0807	\$0.1607	\$0.1383	\$0.0781		
Repairs, dipper dredges.....	.0905	.2045	.2147	.0668		
Depreciation, dipper dredges.....	.0889	.0215	.0886	.0224		
Operation, pipe-line suction dredges.....	.1165	.0739	.0837	.0489	\$0.1005	\$0.0595
Repairs, pipe-line suction dredges.....	.0482	.0858	.0221	.0502	.0948	.0309
Depreciation, pipe-line suction dredges.....	.0061	.0039	.0010	.0025	.0032	.0030
Operation, tugs and scows.....	.1866	.1094	.1126	.0699		
Repairs, tugs and scows.....	.1826	.3165	.1454	.0572		
Depreciation, tugs and scows.....	.0143	.0132	.0057	.0073		
Operation, miscellaneous floating equipment.....	.0108	.0073	.0089		.0031	.0049
Repairs, miscellaneous floating equipment.....	.0047	.0037	.0024	.0020	.0030	.0014
Depreciation, miscellaneous floating equipment.....	.0009	.0006	.0005	.0003	.0003	.0001
Operation, drill barges.....	1.4689					
Repairs, drill barges.....	.1943					
Depreciation, drill barges.....	.0157					
Operation, hydraulic graders.....	.0299					
Repairs, hydraulic graders.....	.0074					
Depreciation, hydraulic graders.....	.0019					
Channel lights.....	.0003					
Clearing.....		.0007				
Dikes.....		.0056	.0021			
Maintenance, water lines.....	.0031				.0263	.0079
Pipe lines.....	.0883	.0220	.0119	.0140		
Relay pumps.....	.2245					
Sluicing.....	.0183					
Surveys.....	.0160	.0098	.0064	.0042	.0024	.0009
Division expense.....	.1474	.1427	.0885	.0364	.0386	.0325
Total division unit cost.....	.7586	.5149	.2839	.1875	.2169	.1411
Amount expended.....	1,575,313.68	342,174.27	98,851.72	1134,351.23	54,775.25	24,864.08
Quantities excavated (cubic yards):						
Dipper dredges—						
Earth.....	411,900	88,800	67,150	43,000		
Rock.....	1,301,600	62,800		42,300		
Suction dredges—						
Earth.....	315,600	508,800	281,000	596,400	252,900	581,200
Rock.....	47,500	4,300				25,100
Total.....	2,076,600	664,700	348,150	681,700	252,900	586,300

1 Includes \$0,504.24, maintenance dikes.

TABLE No. 25.—*Dredging excavations, fiscal year 1921—Maintenance—Continued.*

Detail of charges.	Unit costs.						
	Gaillard Cut.	Pacific entrance.	Balboa Inner Harbor.	Atlantic entrance.	Cristobal Inner Harbor.	Gatun Lake.	Miraflores Lake.
Previous fiscal year:							
Total division unit cost.....	\$0.5263	\$0.1858	\$0.3725			\$0.8505	
Amount expended.....	1,116,835.70	200,835.16	188,354.01	1 \$0,017.14		6,293.82	\$23.95
Quantities excavated (cubic yards):							
Dipper dredges—							
Earth.....	890,535	1,543,600	179,750			7,400	
Rock.....	1,160,175	18,000					
Suction dredges—							
Earth.....	29,300	3,300	325,900				
Rock.....	41,700						
Total.....	2,121,710	1,564,900	595,650			7,400	
RECAPITULATION.							
					Yardage.	Expended.	Cost per cubic yard.
Fiscal year 1920.....					4,199,660	\$1,611,359.78	\$0.3837
Fiscal year 1921.....					4,722,250	2,312,947.54	.4897

1 Covers maintenance dikes.

TABLE NO. 26.—*Statement of Chagres River sand and gravel production, issues, and sales.*—The production in the fiscal year was 177,332 cubic yards, and the sales 41,364 cubic yards. The unit cost was \$1.4447 a cubic yard. For further details see annual report of the auditor.

TABLE NO. 27.—*Receipts, issues, and transfers of stores and purchases charged to divisions.*—This statement shows the items by months for the fiscal year 1921. For details see the annual report of the auditor.

TABLE NO. 28.—*Comparative statement of store balance, July 1, 1920, and July 1, 1921.*—For details see the annual report of the auditor. The store balance at the end of the fiscal year 1920 had a book value of \$5,580,106.94, and at the end of the fiscal year 1921, \$8,515,384.99.

TABLE No. 29.—Statement of appropriation, receipts, and disbursements for fiscal year ended June 30, 1921.

	Cash balance, July 1, 1920.	Appropriations.	Repayments.		Total.	Expenditures.			Cash balance June 30, 1921.
			By collections.	By transfers.		By cash disbursements.	By transfers.	Total.	
Construction appropriations:									
Canal connecting Atlantic and Pacific Oceans.....	\$398,173.33				\$398,173.33				
Panama Canal fund.....	131,992.08				131,992.08	\$4,659.59	\$364,410.98	\$369,070.57	\$29,102.76
Construction and equipment, Panama Canal.....	1,803,986.92		\$8,793.57	\$1,889,385.98	3,702,166.47	2,317,088.68	698,080.56	3,010,119.24	692,047.23
Private act, Feb. 18, 1913, Oscar F. Lackey.....	1,500.00				1,500.00				1,500.00
Repayment to McClintic-Marshall Construction Co., Panama Canal.....		\$714,007.39			714,007.39	714,007.39		714,007.39	
Total construction.....	2,335,652.33	714,007.39	8,793.57	1,889,385.98	4,947,839.27	3,035,755.66	1,057,441.54	4,093,197.20	854,642.07
Operation and maintenance appro- priations:									
Annual payment to Republic of Panama.....		250,000.00			250,000.00	250,000.00		250,000.00	
Maintenance and operation, Panama Canal.....	9,570,946.29	7,531,851.00	14,658,296.71	2,415,101.53	34,186,195.53	27,542,597.96	1,635,708.89	29,178,306.85	5,007,888.68
Sanitation, Canal Zone, Panama Canal.....	290,096.99	850,000.00	693,098.70	24,352.28	1,857,577.97	1,388,419.27	198,533.13	1,586,952.40	270,625.57
Civil government, Panama Canal and Canal Zone.....	152,447.15	924,670.00	67,268.91	20,000.00	1,164,386.09	914,549.29	102,714.69	1,017,263.98	147,122.11
Increase of compensation.....	3,035.64	34,500.00			37,535.64	31,809.93		31,809.93	5,725.71
Total operation and mainte- nance.....	10,016,526.07	9,591,021.00	15,428,664.35	2,459,483.81	37,495,695.23	30,127,376.45	1,936,956.71	32,064,333.16	5,431,362.07
Other appropriations:									
Censorship of foreign mails, Panama Canal, 1919.....	53,205.21				53,205.21				53,205.21
Regulation of commerce, etc., 1919.....	21,566.80				21,566.80				21,566.80
Army quarters, etc., prior to 1920. Army quarters, etc., fiscal year 1920.....	3,605.13				3,605.13		3,346.88	3,346.88	258.25
Army quarters, etc., fiscal year 1921.....	1,313,999.05				1,313,999.05		1,248,293.74	1,248,293.74	65,705.31
Construction, Panama Canal.....	244,659.21	40,000.00			40,000.00				40,000.00
Total.....					214,659.21		39,691.88	39,691.88	204,967.33

Panama fortifications.....	24,709.36	.....	.....	24,709.36	43.62	23,077.80	23,121.42	1,587.94
Protecting Panama Canal and structures.....	35,437.60	.....	.....	35,437.60	.....	26,511.00	26,511.00	8,926.60
Sites for seacoast fortifications, Panama Canal.....	152,020.32	.....	.....	152,020.32	.....	1,153.28	1,153.28	150,867.04
Submarine base, Canal Zone, Panama Canal.....	13,420.71	.....	.....	13,420.71	.....	11,951.43	11,951.43	1,469.28
Total other appropriations..	1,862,623.39	40,000.00	.....	1,902,623.39	43.62	1,354,026.01	1,354,069.63	548,553.76
Grand total.....	14,214,801.79	10,345,028.39	15,437,457.92	44,346,157.89	33,163,175.73	4,348,424.26	37,511,599.93	6,834,557.90

TABLE NO. 30—*Payments made by fiscal officers.*—This table shows the payments made by the paymaster, the disbursing clerk, and the collector, by months, during the fiscal year. The paymaster's payments amounted to \$35,722,189.11; those by the disbursing clerk to \$10,501,410.26; and those by the collector to \$2,068,225.08. For details see the annual report of the auditor.

TABLE NO. 31—*Details of collections and disbursements.*—This table shows the collections and disbursements by the fiscal officers according to classes. The disbursements amounted to \$39,320,833.63 and the collections to \$27,078,636.59. For details see annual report of the auditor.

TABLE NO. 32.—*Statement of audited pay rolls on Isthmus during fiscal year 1921.*

	Total.	Salaries.	Wages.
Operation and maintenance:			
Executive office—			
Executive.....	\$21,271.13	\$21,271.13	.....
Record.....	79,829.90	79,167.06	\$662.84
Personnel.....	35,019.15	35,019.15	.....
Correspondence.....	38,847.89	38,480.87	367.02
Property.....	32,651.60	32,651.60	.....
Statistics.....	18,960.89	18,960.89	.....
General.....	24,435.41	24,435.41	.....
Pay rolls.....	104,061.31	104,061.31	.....
Shipping commissioner.....	32,414.23	32,414.23	.....
Special attorney.....	3,317.50	3,317.50	.....
Motor cars.....	14,895.83	4,988.84	9,906.99
Clubs and playgrounds.....	174,723.34	152,506.03	22,217.31
Total, executive office.....	580,428.18	547,274.02	33,154.16
Engineer of maintenance—			
Lock operation—			
Atlantic.....	400,875.10	104,300.33	296,574.77
Pacific.....	589,142.44	159,619.57	429,522.87
Electrical.....	753,661.51	206,340.91	547,320.60
Dredging.....	1,251,007.69	290,201.68	960,806.01
Municipal engineering.....	887,243.76	292,481.63	594,762.13
Balboa incinerator.....	8,651.48	.....	8,651.48
Office engineer.....	35,673.24	34,866.61	806.63
Meteorology and hydrography.....	29,790.31	24,295.58	5,494.73
Surveys.....	39,035.05	25,138.89	13,896.16
Gatun dam and backfill.....	41,409.17	9,864.50	31,544.67
Total, engineer of maintenance.....	4,036,489.75	1,147,109.70	2,889,380.05
Marine division—			
Office.....	8,491.42	8,491.42	.....
Port captain—			
Balboa.....	482,439.85	212,724.78	269,715.07
Cristobal.....	419,460.24	216,851.86	202,608.38
Lighthouse division.....	115,520.31	28,175.33	87,344.98
Total, marine division.....	1,025,911.82	466,243.39	559,668.43
Mechanical division—			
Balboa.....	3,055,760.29	365,482.25	2,690,278.04
Cristobal.....	854,455.61	72,070.41	782,385.20
Total, mechanical division.....	3,910,215.90	437,552.66	3,472,663.24
Supply department—			
Quartermaster—			
Office.....	41,352.93	41,352.93	.....
Storehouses.....	384,906.51	229,987.11	154,919.40
District quartermaster.....	942,795.30	265,438.71	677,356.59
Printing plant.....	90,394.33	23,582.36	66,811.97
Fuel-oil plants.....	81,562.62	10,798.98	70,763.64
Total, quartermaster.....	1,541,011.69	571,160.09	969,851.60
Subsistence.....	247,921.79	103,143.59	144,778.20
Total, quartermaster and subsistence.....	1,788,933.48	674,303.68	1,114,629.80

TABLE NO. 32.—*Statement of audited pay rolls on Isthmus during fiscal year 1921—Con.*

	Total.	Salaries.	Wages.
Operation and maintenance—Continued.			
Accounting—			
Auditor.....	\$425, 174. 62	\$424, 284. 62	\$890. 00
Paymaster.....	41, 993. 19	41, 993. 19	.....
Collector.....	42, 070. 06	42, 070. 06	.....
Total accounting.....	509, 237. 87	508, 347. 87	890. 00
Building.....	1, 175, 410. 77	236, 239. 92	939, 170. 85
Fortifications.....	415, 605. 19	133, 322. 29	282, 282. 90
Injury and death—			
Old act.....	416. 62	.....	416. 62
New act.....	56, 300. 55	2, 103. 44	54, 197. 11
Total, operation and maintenance.....	13, 498, 950. 13	4, 152, 496. 97	9, 346, 453. 16
Construction and equipment, joint commission.....	308. 34	308. 34	.....
Civil government:			
Civil affairs.....	40, 205. 57	40, 205. 57	.....
Posts.....	110, 534. 61	110, 534. 61	.....
Police and prisons.....	319, 812. 30	319, 812. 30	.....
Fire protection.....	93, 495. 59	93, 495. 59	.....
Schools.....	165, 852. 99	165, 852. 99	.....
District court.....	19, 132. 89	19, 132. 89	.....
District attorney.....	8, 709. 41	8, 709. 41	.....
Marshal.....	7, 375. 00	7, 375. 00	.....
Magistrate courts.....	13, 719. 90	13, 719. 90	.....
Total, civil government.....	778, 838. 26	778, 838. 26	.....
Sanitation:			
Office.....	11, 268. 84	11, 268. 84	.....
Medical store.....	11, 904. 09	10, 758. 66	1, 145. 43
Ancon Hospital.....	392, 803. 41	325, 349. 89	67, 453. 52
Colon Hospital.....	64, 477. 92	57, 417. 30	7, 060. 62
Santo Tomas Hospital.....	12, 551. 82	12, 551. 82	.....
Palo Seco Leper Asylum.....	17, 863. 28	8, 390. 51	9, 472. 77
Dispensaries.....	39, 650. 08	38, 962. 08	688. 00
Quarantine—			
Office.....	544. 11	544. 11	.....
Balboa.....	19, 552. 47	15, 222. 45	4, 330. 02
Cristobal.....	26, 364. 75	22, 288. 91	4, 075. 84
Bocas del Toro.....	2, 487. 78	2, 487. 78	.....
Total, quarantine.....	48, 949. 11	40, 543. 25	8, 405. 86
Corozal farm.....	16, 012. 42	4, 125. 27	11, 887. 15
Corozal Asylum.....	52, 795. 65	43, 258. 72	9, 536. 93
Health office—			
Panama.....	120, 185. 55	42, 321. 49	77, 864. 06
Colon.....	92, 215. 00	42, 709. 40	49, 505. 60
Zone sanitation.....	128, 441. 41	32, 302. 05	96, 139. 36
Total, sanitation.....	1, 009, 118. 58	669, 959. 28	339, 159. 30
Grand total.....	15, 287, 215. 31	5, 601, 602. 85	9, 685, 612. 46

TABLE NO. 33.—*Statement of accounts receivable registered during the fiscal year.*—This statement shows the accounts by months. A total of 30,872 bills was registered, representing \$30,413,517.28. This was divided as follows: Against the Panama Railroad, \$4,080,021.24; against the Republic of Panama, \$336,955.35; against other departments of the United States Government, \$3,043,207.29; against steamship companies, \$4,647,912.71; against individuals and companies, \$2,910,367.51; trust funds, \$4,114,665.40; tolls, \$11,280,387.78; repayments to appropriations, \$15,339,392.36.

TABLE No. 34.—*Statement of collections repaid to appropriations and to individuals and companies and collections deposited to miscellaneous receipts during the fiscal year.*—This statement shows the following:

Maintenance and operation, Panama Canal.....	\$11, 384, 462. 26
Sanitation, Canal Zone.....	597, 285. 24
Civil government, Panama Canal and Canal Zone.....	57, 369. 51
Total.....	12, 039, 117. 01
Paymaster, various individuals and companies (\$61).....	195. 21
Paymaster, Panama R. R. commissary books.....	108. 93
Miscellaneous receipts.....	11, 619, 739. 63
Grand total.....	23, 659, 160. 78

For details see the annual report of the auditor.

TABLE No. 35.—*Statement of transactions in the collector's special deposit account.*—For details see annual report of the auditor. Recapitulation follows:

	In the United States.	On the Isthmus.
On hand July 1, 1920.....	\$36, 526. 89	\$440, 652. 40
Deposits during the year.....	820, 182. 19	22, 875, 309. 81
Total.....	906, 709. 08	23, 315, 962. 21
Panama Canal bills applied.....	513, 266. 40	15, 075, 307. 11
Payments to individuals and companies.....	220, 615. 56	7, 709, 475. 64
Refunds.....	158, 289. 12	135, 496. 02
On hand June 30, 1921.....	14, 538. 00	395, 683. 44
Total.....	906, 709. 08	23, 315, 962. 21

TABLE No. 36.—*Balances of miscellaneous trust funds on deposit with collector June 30, 1921.*—Postal savings funds, \$458.00; money-order funds, \$1,170,156.03; trust funds, \$7,769.47; clubhouse funds, \$53,936.82; interest, \$9,121.44; total, \$1,241,441.76.

TABLE No. 37.—*Statement of money orders issued and paid by the Canal Zone and Canal Zone orders paid by other administrations, fiscal years 1907 to 1921, inclusive.*—For details see annual report of the auditor.

TABLE No. 38.—*Postal service—Money-order business of the Canal Zone postal service, fiscal year 1921.*—For details see report of the auditor.

TABLE No. 39.—*Audited revenues, postal service, fiscal years 1907 to 1921.*—For details see report of the auditor.

TABLE No. 40.—*Postal revenues, fiscal year 1921.*—For details see report of the auditor.

TABLE No. 41.—*Postal savings and deposit money-order transactions, fiscal year 1921.*—For details see report of the auditor.

TABLE No. 42.—*Income, bureau of clubs and playgrounds, fiscal year 1921.*—For details see report of the auditor. The total income was \$596,618.07.

TABLE No. 43.—*Expenses, bureau of clubs and playgrounds, fiscal year 1921.*—For details see annual report of the auditor. Total expenditures, \$593,525.30.

TABLE No. 44.—*Summary of income and expenses, bureau of clubs and playgrounds, fiscal year 1921.*—Net earnings of the fiscal year, \$14,393.13.

TABLE No. 45.—*Balance sheet, bureau of clubs and playgrounds.*—For details see report of the auditor. Assets, \$112,442.83; liabilities, surplus, \$77,217.24; accounts payable, \$35,225.59.

TABLE NO. 46.—*Memorandum of coupon books issued on pay-roll deductions; sold for cash; honored at commissaries, hotels, and messes; cash sales to steamships and refund notes accepted at commissaries.*—For complete statement see report of the auditor.

TABLE NO. 47.—*Compensation for injuries and deaths.*—This is a set of seven tables giving details for which see report of the auditor. Paid on account of injuries, fiscal year 1921, \$30,283.37; on account of deaths, \$958.53.

STATEMENT NO. 48.—OPERATIONS WITH PANAMA RAILROAD CO.'S FUNDS.

The accounts of the railroad company show the results of the operations of the railroad proper, harbor terminals, coaling plants, stables, baggage transfer, and motor-car machine shops, carried on under the direction of the superintendent of the railroad; of the telephone system under the electrical engineer of The Panama Canal; of renting of lands and buildings under the land agent; of the Hotel Washington, commissaries, plantations, cattle, poultry, hog, and dairy farms under the chief quartermaster of The Panama Canal.

RAILROAD, HARBOR, TERMINALS, ETC.

The net revenue from the railroad proper decreased \$42,724.09 as compared with previous year, and the expenses increased \$134,857.91, resulting in a net loss of \$156,713.23.

The harbor terminal operations resulted in a net loss of \$22,878.56 as compared with a net profit of \$136,718.19 for last year.

The gross receipts for coal sold were \$7,400,758.15, and the value of this coal, including operating expenses, was \$7,027,434.52, leaving a profit for the year of \$373,323.63, as compared with \$969,402.11 for the previous year.

The Panama stables continued under a lease, showing a net revenue return of \$808.14, as compared with \$965.54 the previous year.

The operation of the Colon stables resulted in a net profit of \$1,508.24, as compared with a loss of \$2,436.82. Baggage transfer service operated at a profit of \$4,280.40, a decrease of \$178.81. The net profit from operation of motor-car machine shop was \$3,778.75, as compared with a loss of \$1,606.93 for the previous year. The cost of operating the telephone system was \$5,939.74 in excess of revenues.

The net revenue from rental of lands was \$107,823.04 and buildings \$7,227.07, an increase over previous year of \$7,767.81. The operation of the Hotel Washington shows a profit of \$14,778.08, a decrease of \$24,046.01, \$13,687.56 having been charged to operations as a reserve for depreciation of buildings.

FARM INDUSTRIES.

The gross revenue from plantation products shows a decrease of \$21,606.99, while the operating expenses show a decrease of \$28,475.41, resulting in a net loss of \$9,408.18, as compared with a loss of \$16,276.60 the previous year.

Poultry farm.—Revenue amounted to \$10,649.57. The cost of poultry sold, including operating expenses, was \$17,939 in excess of the revenue.

Hog farm.—The cost of operating the hog farm was \$39,221.27. The receipts from hogs sold and turned into commissary abattoir amounted to \$109,755.33, the cost of which, including operating expenses, was \$121,601.25, resulting in a loss of \$11,845.92 for the year.

Dairy farm.—The operating expenses were \$69,003.40, a decrease from last year of \$14,070.99, and the products disposed of, consisting of milk, cream, and calves, amounted to \$64,975.29, a decrease in gross receipts from last year of \$13,722.45, resulting in a net profit of \$5,418.26, as compared with a loss of \$6,787.29 the previous year.

Cattle.—The cattle steamer *Caribbean* was continued in the service, bringing cattle from Colombia until the latter part of May. There were 16,055 head of cattle imported by this steamer during this period, and a total of 13,587 head was sold or turned into

the abattoir for \$1,221,229.54, resulting in a gross profit of \$234,458.76, from which were deducted \$229,434.94, which amount represents the steamship operating loss and amortization of pastures, leaving a net profit of \$5,032.82.

COMMISSARY.

Gross receipts from the sale of commissary supplies amounted to \$11,112,334.29, as compared with \$12,407,421.06 last year. Supplies were purchased to the amount of \$8,096,039.35, including \$1,341,634.44 for cattle, hogs, and poultry purchased on the Isthmus. The net loss amounted to \$216,992.59. The value of supplies on hand June 30, 1921, was \$1,981,593.87.

GENERAL.

The result of all operations of the Panama Railroad on the Isthmus shows a net profit of \$83,282.11, as compared with a profit of \$1,064,427.81 for the corresponding period last year.

During the present year \$1,660,920.21, representing completed improvements, were added to the capital amount. Regardless of this, however, our capital accounts were increased by only \$65,000, due to the fact that \$1,595,000 were written out, the principal items being railroad and appurtenances, \$625,500; railroad equipment, \$194,000; buildings and other structures, \$20,000. There remains authorized for improvements \$80,964.06, of which \$72,668.66 were expended up to June 30, 1921. The principal items under construction are commissary plants and stores, \$73,583.06.

Detailed statements of revenues, expenses, and statistics of all railroad industries, including steamship line, will appear in the regular railroad annual report.

TABLE No. 49.—Summary of commercial traffic through The Panama Canal during the fiscal year 1921 and since its opening to commercial traffic.

	Atlantic to Pacific.				Pacific to Atlantic.				Total.			
	Vessels.	Canal tonnage.		Tons of cargo.	Vessels.	Canal tonnage.		Tons of cargo.	Vessels.	Canal tonnage.		Tons of cargo.
		Gross.	Net.			Gross.	Net.			Gross.	Net.	
1920.												
July.....	107	469, 188	361, 850	398, 317	118	639, 891	491, 948	488, 497	225	1, 109, 079	856, 38	886, 814
August.....	143	622, 073	492, 504	539, 954	123	586, 398	458, 841	500, 786	266	1, 208, 471	951, 345	1, 040, 740
September.....	125	647, 033	504, 349	444, 217	131	646, 437	504, 436	565, 340	256	1, 293, 470	1, 008, 785	1, 009, 557
October.....	119	599, 920	470, 536	488, 713	119	591, 016	465, 043	502, 353	238	1, 190, 936	935, 579	991, 066
November.....	123	593, 207	467, 951	491, 109	115	590, 865	461, 924	493, 801	238	1, 184, 072	929, 875	994, 910
December.....	145	698, 602	554, 932	619, 451	120	600, 262	472, 986	457, 088	265	1, 298, 864	1, 027, 918	1, 076, 539
Total for first half of fiscal year	762	3, 630, 023	2, 852, 122	2, 981, 761	726	3, 654, 869	2, 858, 178	3, 007, 865	1, 488	7, 284, 892	5, 710, 300	5, 989, 626
1921.												
January.....	134	649, 877	517, 719	557, 158	145	733, 901	576, 604	619, 895	279	1, 383, 778	1, 094, 323	1, 177, 053
February.....	114	556, 798	435, 233	474, 872	127	623, 181	481, 605	478, 032	241	1, 179, 979	916, 838	952, 904
March.....	140	784, 748	613, 591	636, 579	115	632, 472	490, 227	447, 984	255	1, 417, 220	1, 112, 818	1, 084, 563
April.....	118	615, 818	492, 506	500, 801	109	587, 269	462, 997	406, 812	227	1, 203, 087	955, 503	907, 613
May.....	100	529, 408	414, 429	381, 323	110	563, 194	450, 188	411, 412	210	1, 092, 602	864, 617	792, 735
June.....	103	520, 884	415, 302	359, 584	89	439, 973	346, 175	335, 136	192	960, 857	761, 477	694, 720
Total for second half of fiscal year.....	709	3, 657, 533	2, 888, 780	2, 910, 317	695	3, 579, 990	2, 816, 796	2, 699, 271	1, 404	7, 237, 523	5, 705, 576	5, 609, 588
Total for fiscal year 1921.....	1, 471	7, 287, 556	5, 740, 902	5, 892, 078	1, 421	7, 234, 859	5, 674, 974	5, 707, 136	2, 892	14, 522, 415	11, 415, 876	11, 599, 214
Fiscal year ending June 30, 1915.....	522	2, 657, 865	1, 860, 276	2, 070, 993	553	2, 758, 922	1, 932, 296	2, 817, 461	1, 075	5, 416, 787	3, 792, 572	4, 888, 454
Fiscal year ending June 30, 1916.....	396	1, 912, 846	1, 277, 728	1, 369, 019	362	1, 683, 683	1, 118, 434	1, 725, 095	758	3, 596, 529	2, 396, 162	3, 094, 114
Fiscal year ending June 30, 1917.....	874	4, 170, 733	2, 819, 848	2, 929, 260	929	4, 360, 088	2, 978, 709	4, 129, 393	1, 803	8, 530, 821	5, 798, 557	7, 058, 563
Fiscal year ending June 30, 1918.....	915	3, 938, 042	2, 736, 542	2, 639, 300	1, 154	5, 433, 297	3, 837, 531	4, 892, 731	2, 069	9, 371, 339	6, 574, 073	7, 532, 031
Fiscal year ending June 30, 1919.....	857	3, 458, 417	2, 673, 958	2, 740, 254	1, 167	4, 418, 186	3, 451, 032	4, 176, 367	2, 024	7, 876, 603	6, 124, 990	6, 916, 621
Fiscal year ending June 30, 1920.....	1, 180	5, 391, 567	4, 168, 873	4, 092, 516	1, 298	5, 668, 252	4, 377, 171	5, 281, 983	2, 478	11, 059, 819	8, 546, 044	9, 374, 499
Fiscal year ending June 30, 1921.....	1, 471	7, 287, 556	5, 740, 902	5, 892, 078	1, 421	7, 234, 859	5, 674, 974	5, 707, 136	2, 892	14, 522, 415	11, 415, 876	11, 599, 214
Total.....	6, 215	28, 817, 026	21, 278, 127	21, 733, 420	6, 884	31, 557, 287	23, 370, 147	28, 730, 076	13, 099	60, 374, 313	44, 648, 274	50, 463, 496

TABLE No. 50.—Number of commercial vessels of various nationalities passing through The Panama Canal.

	Argentinian.	Belgian.	Brazilian.	British.	Canadian.	Chilean.	Chinese.	Colombian.	Costa Rican.	Cuban.	Danish.	Dutch.	Ecuadorian.	Finnish.	French.	German.	Greek.	Honduran.	Italian.	Japanese.	Jugo-Slav.	Mexican.	Nicaraguan.	Norwegian.	Panamanian.	Peruvian.	Portuguese.	Russian.	Spanish.	Swedish.	United States.	Uruguayan.	Total.	
ATLANTIC TO PACIFIC.																																		
1920—July.....				34		6	1	1	1		1	1	1		3				2	3	1	2				2				1	2	47		107
August.....				50		6	1	2	2		1	1			6					8			2		4						56		143	
September.....				36		4	1	1	1		3	2			3	1			1	5				1	2				6		50		125	
October.....	1			47		1		1	1			2			1				2	3				4	1	2			5	1	47		119	
November.....				37		2					6	1			1				3	10	3			3	1	3			3	2	56		123	
December.....				52		5		1	1		3	3			2				1	6	4			8	4	2			5	1	52		145	
1921—January.....				47		8		1	1		4	3			4				2	10	6			11	2				2	2	45		134	
February.....				37		2			1		3	2			2				2	8	2			8	1	1				1	2	42		114
March.....				53		1					3	2			2				2	13	3			5	3	3				2	54		140	
April.....		1		47		1					2	3			1	1				6	1			5	3	3				1	45		118	
May.....				36		1					1	2			1	1			2	8	6			8	3	3					38		100	
June.....				26		3					2	3			2				1	6	6	2		7		3					1	47		103
Total fiscal year—																																		
1921.....	1	1	1	502		40	2	8	8		28	26			26	3			13	86	1	4		76	5	32		1	22	15	579		1,471	
1920.....			2	393		38	2				4	17			9	5			13	84				46	3	37		1	2	10	493	1	1,180	
1919.....				306	2	48	2	1	6		37	6			29		1			47	267			56	3	33		3	2	10	267	1	857	
1918.....				305		50			10			30			19				2	33	41			145	4	41			5	12	218		915	
1917.....				371		50			11	3	26	36			4				2	54	6		1	70	4	43		1	10	7	176		874	
1916.....				193		16					10	11							1	19			18	2	16					5	103		396	
1915.....				226	1	16					11	5			2				1	4			1	16	2	2				7	223		522	
Total.....	1	3	2,296	3	258	6	1	35	3	160	131				89	8	2	3	31	327	1	10		2	427	14	204	1	13	59	66	2,059	2	6,215
PACIFIC TO ATLANTIC.																																		
1920—July.....				35		3	1		1	1	3	1				2			2	6				2		4					57		118	
August.....				37		2		2	2						2					4	1			3		3			1	1	65		123	
September.....				43		3		1	1		3	2				1			2	4				4	2	1			1		64		131	
October.....				37		2			1						3					5				7		3			3	1	50		119	
November.....				38		3					2	1			1	3			2	3				2	1	2			7	1	49		115	
December.....	1			41		2	1		1		2	2			2	2			2	3				4	3	3			2	1	53		120	
1921—January.....				53		1		1	1		6	4			2				2	4				7	3	3			3	1	7		145	
February.....				43		1		1	1		4	2			2				1	3				10		2			5	1	58		127	
March.....				38		1					4	4			2				2	4				10		2			1	1	46		115	
April.....				34		1					4	2			3				1	9				5		2			1	1	45		109	

[illegible]

TABLE No. 51.—*Origin and destination of all commercial cargo passing through The Panama Canal from the Pacific to the Atlantic, fiscal year, 1921.*
 [Figures represent tons of 2,240 pounds.]

	From—								To—									
	Totals.	Miscellaneous.	Hawaiian Islands.	West coast of Central America.	West coast of Canada.	Australasia.	Far East.	West coast of United States.	West coast of South America.	East coast of United States.	British Isles.	Other European.	Cristobal, Canal Zone.	East coast of Canada.	West Indies.	Azore Islands (for orders).	Africa.	Miscellaneous.
1920.																		
July.....	488,497	.....	.....	6,337	8,189	72,059	145,369	166,866	89,677	164,613	170,994	74,154	15,114	.....	40,810	.....	22,124	688
August.....	500,786	.....	.....	3,597	15,999	69,514	72,788	116,729	222,159	217,350	161,979	41,333	34,778	.....	21,049	.....	16,650	7,647
September.....	565,340	5,575	5,637	2,095	9,453	69,415	102,264	135,627	235,274	320,634	133,696	56,531	12,553	.....	16,712	.....	25,214	.....
October.....	502,353	.....	.....	3,000	12,318	45,565	29,315	191,237	208,547	193,161	181,824	77,238	23,036	.....	6,851	.....	7,622	6,000
November.....	493,801	.....	.....	1,502	11,401	48,864	38,167	193,790	200,077	197,226	133,102	131,981	15,165	.....	10,717	.....	5,610	.....
December.....	457,088	.....	.....	1,559	5,536	42,928	12,080	137,029	257,956	179,652	138,572	92,741	19,388	.....	7,990	.....	.....	.....
One-half year	3,007,865	5,575	18,008	18,090	62,896	348,345	399,983	941,278	1,213,690	1,272,036	920,167	473,978	120,034	.....	104,129	25,966	71,610	19,945
1921.																		
January.....	619,895	.....	.....	1,785	17,946	110,905	21,745	207,303	260,211	193,390	218,040	171,840	23,534	8,463	4,628	.....	.....	.....
February.....	478,032	.....	.....	2,000	3,869	26,807	24,098	179,518	241,740	157,586	125,806	101,590	4,706	2,659	34,188	38,667	.....	12,830
March.....	447,984	.....	.....	6,048	19,281	63,912	19,653	142,403	196,687	153,136	151,881	98,371	10,906	5,436	1,153	15,524	.....	.....
April.....	406,812	.....	.....	4,906	7,270	79,973	16,045	135,729	157,489	174,811	128,077	93,818	8,562	.....	1,589	.....	.....	955
May.....	411,412	.....	.....	8,332	11,120	51,533	7,813	185,209	107,466	156,016	118,547	110,169	14,549	.....	6,188	.....	.....	.....
June.....	335,136	.....	.....	8,104	3,256	45,474	16,735	157,408	103,310	147,868	100,913	66,349	13,603	.....	5,659	.....	.....	11,744
One-half year	2,699,271	240	45,948	31,175	62,742	378,604	106,089	1,007,570	1,066,903	976,807	843,264	642,137	75,860	16,558	52,405	54,191	.....	38,049
Fiscal year.....	5,707,136	5,815	63,956	49,265	125,638	726,949	506,072	1,948,848	2,280,593	2,248,843	1,763,431	1,116,115	195,894	16,558	156,534	80,157	71,610	57,994
Per cent of total cargo.....	100.0	0.1	1.1	0.9	2.2	12.7	8.9	34.1	40.0	39.4	30.9	19.6	3.4	0.3	2.7	1.4	1.3	1.0

TABLE No. 52.—Origin and destination of all commercial cargo passing through The Panama Canal from the Atlantic to the Pacific, fiscal year 1921.

[Figures represent tons of 2,240 pounds.]

	From—										To—						
Totals.	Miscellaneous.	West Indies.	South America, east coast.	Canada, east coast.	Mexico, east coast.	Cristobal, Canal Zone.	Other European.	British Isles.	East coast of United States.	South America, west coast.	United States, west coast.	Far East.	Australasia.	Canada, west coast.	Central America, west coast.	Balboa, Canal Zone.	Miscellaneous.
1920.																	
July.....	1,022	9,400	1,815	.....	71,569	16,085	13,221	52,062	233,143	149,037	39,359	92,041	72,516	15,974	9,626	19,764	.....
August.....	539,954	28	5,035	5,500	104,159	12,252	15,826	87,814	309,340	177,078	76,004	158,352	95,977	9,426	1,578	19,416	2,123
September.....	444,217	2,867	6,903	6,109	81,533	18,889	6,818	56,283	264,815	161,771	89,243	105,158	67,696	5,534	1,738	13,077	.....
October.....	488,713	.....	.....	.....	64,661	17,450	27,202	48,360	331,040	189,748	59,526	125,642	98,322	3,290	1,685	10,500	.....
November.....	491,109	.....	1,693	3,795	73,200	10,261	15,274	45,666	341,220	198,400	86,068	58,610	132,523	10,368	5,140	.....	.....
December.....	619,451	.....	524	7,583	81,383	17,063	18,593	38,174	456,131	276,574	76,400	149,680	84,205	500	7,770	24,372	.....
One-half year.	1,022	12,295	15,970	22,987	476,505	92,000	96,934	328,359	1,935,689	1,152,608	426,600	689,433	551,239	45,092	27,537	87,129	2,123
1921.																	
January.....	557,158	5,091	2,365	.....	110,830	14,310	27,589	41,152	355,821	196,127	126,952	86,180	107,213	6,433	2,354	31,899	.....
February.....	474,872	11,360	.....	5,684	95,653	7,120	18,492	18,544	318,019	174,006	109,899	93,771	71,138	10,150	3,981	8,927	3,000
March.....	636,579	38,710	171	2,808	145,949	7,019	46,533	84,086	311,303	149,368	127,788	147,367	140,454	28,040	2,915	40,647	.....
April.....	500,801	25,211	6,916	6,150	82,985	6,394	27,225	40,002	305,918	121,679	136,582	110,916	112,890	6,392	2,342	10,000	.....
May.....	381,323	.....	1,131	1,396	87,720	3,650	19,405	24,447	243,574	73,871	139,458	92,997	60,985	418	910	10,549	2,135
June.....	359,584	.....	954	1,536	72,140	8,672	26,748	8,829	241,705	70,883	109,145	90,977	37,956	29,889	7,195	7,183	6,356
One-half year.	2,910,317	80,372	11,537	16,574	595,277	47,165	165,992	217,060	1,776,340	785,934	749,824	622,208	530,636	81,322	19,697	109,205	11,491
Fiscal year.....	5,892,078	92,667	27,507	39,561	1,071,782	139,165	262,926	545,419	3,712,029	1,938,542	1,176,424	1,311,641	1,081,875	126,414	47,234	196,334	13,614
Per cent of total cargo.....	100.0	1.6	.5	.7	18.2	2.3	4.5	9.3	63.0	32.9	20.0	22.3	18.4	2.1	.8	3.3	.2

TABLE NO. 53-A.—*Number of commercial vessels by nationality passing through The Panama Canal from its opening to June 30, 1921, by fiscal years.*

Nationality.	1915	1916	1917	1918	1919	1920	1921	Total.
Argentina.....		1		1				2
Belgian.....					1	1	2	4
Brazilian.....						3	1	4
British.....	465	358	780	702	607	753	972	4,637
Chilean.....	35	33	99	96	93	79	63	498
Chinese.....				2	4	2	4	12
Colombian.....					1	1		2
Costa Rican.....			23	19	12	1	16	71
Cuban.....			6				1	7
Danish.....	24	18	43	100	79	9	60	333
Dutch.....	7	15	74	48	19	29	50	242
Ecuadorian.....					1			1
Finnish.....							2	2
French.....	3	1	9	52	104	60	44	273
German.....						17	19	36
Greek.....				2	3			5
Honduran.....	3	3						6
Italian.....	2	1	2	4		26	25	60
Japanese.....	6	24	72	54	87	118	136	497
Jugo-Slav.....							2	2
Mexican.....			13	1	1		4	19
Nicaraguan.....	1		2					3
Norwegian.....	42	44	145	296	128	106	140	901
Panamanian.....	1	3	5	2		4	8	23
Peruvian.....	4	30	86	83	64	75	60	402
Portuguese.....						2		2
Russian.....	6	1	2	3	3	2	4	21
Spanish.....			20	11	5	41	44	121
Swedish.....	17	13	18	26	27	19	25	145
United States.....	459	213	404	567	784	1,129	1,210	4,766
Uruguayan.....					1	1		2
Total.....	1,075	758	1,803	2,069	2,024	2,478	2,892	13,099

TABLE NO. 53-B.—*The Panama Canal net tonnage of commercial vessels by nationality passing through The Panama Canal from its opening to June 30, 1921, by fiscal years.*

Nationality.	1915	1916	1916	1918	1919	1920	1921	Total:
Argentina.....		2,335		(1)				2,335
Belgian.....					265	266	8,092	8,623
Brazilian.....						19,164	4,566	23,730
British.....	1,630,833	1,161,097	2,663,250	2,529,203	1,915,744	2,760,188	3,978,329	16,638,644
Chilean.....	94,638	91,243	265,210	254,841	253,561	212,000	159,727	1,331,220
Chinese.....				7,799	15,204	7,799	12,098	42,900
Colombian.....					66	95		161
Costa Rican.....			1,909	1,577	995	25	2,784	7,290
Cuban.....			9,292				702	9,994
Danish.....	92,537	68,011	163,882	272,946	213,534	32,221	236,512	1,079,643
Dutch.....	21,075	39,642	260,500	197,627	88,299	152,535	248,801	1,008,479
Ecuadorian.....					66			66
Finnish.....							4,281	4,281
French.....	10,703	4,343	38,889	147,805	253,774	114,664	155,889	726,067
German.....						52,755	67,334	120,089
Greek.....				6,572	8,003			14,575
Honduran.....	122	484						606
Italian.....	4,158	3,861	6,430	17,218		98,692	102,783	233,142
Japanese.....	24,897	81,818	291,500	238,814	341,064	515,243	613,245	2,106,581
Jugo-Slav.....							4,508	4,508
Mexican.....			24,446	229	113		5,032	29,820
Nicaraguan.....	46		1,598					1,644
Norwegian.....	130,776	172,459	490,534	876,024	497,555	397,632	548,227	3,113,207
Panamanian.....	15	439	160	60		1,007	1,370	3,051
Peruvian.....	9,403	74,429	218,593	208,958	160,956	191,689	157,495	1,027,523
Portuguese.....						9,002		9,002
Russian.....	22,400	1,475	4,546	5,700	5,699	6,093	11,279	57,192
Spanish.....			49,124	24,469	11,066	106,651	117,400	308,710
Swedish.....	50,824	41,537	69,202	80,191	95,684	76,825	113,661	527,924
United States.....	1,700,145	652,989	1,239,492	1,704,040	2,257,342	3,791,088	4,861,761	16,206,857
Uruguayan.....					(2)	410		410
Total.....	3,792,572	2,396,162	5,798,557	6,574,073	6,124,990	8,546,044	11,415,876	44,648,274

¹ Argentine Navy school ship of 2,187 tons displacement.² Uruguayan cruiser of 3,100 tons displacement.

TABLE No. 53-C.—Tons of cargo carried by commercial vessels passing through The Panama Canal from its opening to June 30, 1921, by fiscal years.

Nationality.	1915	1916	1917	1918	1919	1920	1921	Total.
Belgian.....					464	406	12,700	13,570
Brazilian.....						8,916	6,700	15,616
British.....	2,200,514	1,570,660	3,393,750	2,615,675	1,876,939	2,830,268	3,738,257	18,226,063
Chilean.....	50,879	53,573	184,446	153,259	161,340	104,738	61,737	769,972
Chinese.....				13,417	13,421	13,700	14,400	54,938
Colombian.....						27		27
Costa Rican.....			3,069	2,091	1,137		2,112	8,409
Cuban.....			7,370				1,200	8,570
Danish.....	116,603	94,950	242,567	420,063	325,277	42,533	322,059	1,564,052
Dutch.....	26,402	61,959	314,203	233,063	119,297	128,442	216,488	1,099,854
Ecuadorian.....					72			72
Finnish.....							7,101	7,101
French.....	13,600	7,176	36,680	159,859	286,812	125,249	132,836	762,212
German.....						59,239	73,837	133,076
Greek.....				5,741	8,301			14,042
Honduran.....		321						321
Italian.....	900		5,700	13,793		63,441	47,988	131,822
Japanese.....	42,600	117,780	446,358	407,399	503,427	726,338	758,617	3,002,519
Jugo-Slav.....							8,325	8,325
Mexican.....			22,545	253	142		3,785	26,725
Nicaraguan.....	6							6
Norwegian.....	166,522	229,368	597,581	1,090,823	577,679	404,323	637,887	3,704,183
Panamanian.....			135			872	1,500	2,507
Peruvian.....	8,202	62,210	159,609	143,344	121,524	119,418	105,322	719,629
Portuguese.....						10,775		10,775
Russian.....	21,030	24	3,230	7,059	8,340	12,867	11,343	63,893
Spanish.....			71,080	35,394	10,047	101,563	143,076	361,160
Swedish.....	53,292	47,236	94,515	132,521	143,516	74,244	128,919	674,243
United States.....	2,187,904	848,857	1,475,725	2,098,277	2,758,886	4,547,140	5,163,025	19,079,814
Total.....	4,888,454	3,094,114	7,058,563	7,532,031	6,916,621	9,374,499	11,599,214	50,463,496

TABLE No. 54.—Statement showing the number of vessels, the Panama Canal net tonnage, tolls assessed, and tons of cargo carried by vessels of the principal nations passing through The Panama Canal during the first seven years of its operation.

Nationality.	Year.	Number of ships.	Panama Canal net tonnage.	Tolls.	Tons of cargo.
United States.....	1915	459	1,700,145	\$2,002,845.77	2,187,904
	1916	213	652,989	724,219.01	848,857
	1917	404	1,239,492	1,238,322.63	1,475,725
	1918	567	1,704,040	1,713,827.23	2,098,277
	1919	784	2,257,342	2,327,261.48	2,758,886
	1920	1,129	3,791,088	3,805,924.77	4,547,140
	1921	1,210	4,861,761	4,784,577.35	5,163,025
		4,766	16,206,857	16,596,978.24	19,079,814
British.....	1915	465	1,630,833	1,847,341.10	2,200,514
	1916	358	1,161,097	1,140,395.07	1,570,660
	1917	780	2,663,250	2,595,158.60	3,393,750
	1918	702	2,529,203	2,498,596.49	2,615,675
	1919	607	1,915,744	1,954,715.87	1,876,939
	1920	753	2,760,188	2,805,018.50	2,830,268
	1921	972	3,978,329	3,989,281.58	3,738,257
		4,637	16,638,644	16,830,507.21	18,226,063
Norwegian.....	1915	42	130,776	141,066.91	166,522
	1916	44	172,459	149,357.56	229,368
	1917	145	490,534	448,948.53	597,581
	1918	296	876,024	823,748.57	1,090,823
	1919	128	497,555	460,057.68	577,679
	1920	106	397,632	371,408.79	404,323
	1921	140	548,227	523,311.94	637,887
		901	3,113,207	2,917,899.98	3,704,183

TABLE NO. 54.—Statement showing the number of vessels, the Panama Canal net tonnage, tolls assessed, and tons of cargo carried by vessels of the principal nations passing through The Panama Canal during the first seven years of its operation—Continued.

Nationality.	Year.	Number of ships.	Panama Canal net tonnage.	Tolls.	Tons of cargo.
Japanese.....	1915	6	24,897	\$30,260.40	42,600
	1916	24	81,818	83,229.68	117,780
	1917	72	291,500	305,702.63	446,358
	1918	54	238,814	248,063.30	407,399
	1919	87	341,064	364,622.57	503,427
	1920	118	515,243	543,936.93	726,338
	1921	136	613,245	655,176.51	758,617
		497	2,106,581	2,235,992.02	3,002,519
Chilean.....	1915	35	94,638	101,275.95	50,879
	1916	33	91,243	80,192.25	53,573
	1917	99	265,210	236,588.20	184,446
	1918	96	254,841	223,146.30	153,259
	1919	93	253,561	212,511.90	161,340
	1920	79	212,000	169,472.55	104,738
	1921	63	159,727	147,023.75	61,737
		498	1,331,220	1,170,210.90	769,972
Danish.....	1915	24	92,537	110,680.30	116,603
	1916	18	68,011	66,938.80	94,950
	1917	43	163,882	141,461.44	242,567
	1918	100	272,946	249,761.14	420,063
	1919	79	213,534	207,404.47	325,277
	1920	9	32,221	43,528.35	42,533
	1921	60	236,512	241,411.86	322,059
		333	1,079,643	1,061,186.36	1,564,052
Dutch.....	1915	7	21,075	24,103.58	26,402
	1916	15	39,642	43,910.44	61,959
	1917	74	260,500	270,321.78	314,203
	1918	48	197,627	214,211.46	233,063
	1919	19	88,299	97,467.75	119,297
	1920	29	152,535	126,868.98	128,442
	1921	50	248,801	229,248.94	216,488
		242	1,008,479	1,006,132.93	1,099,854
Peruvian.....	1915	4	9,403	10,034.30	8,202
	1916	30	74,429	67,691.30	62,210
	1917	86	218,593	199,860.25	159,609
	1918	83	208,958	177,732.30	143,344
	1919	64	166,956	133,243.12	121,524
	1920	75	191,689	161,964.75	119,418
	1921	60	157,495	107,160.64	105,322
		402	1,027,523	857,686.66	719,629
French.....	1915	3	10,703	12,843.60	13,600
	1916	1	4,343	4,782.50	7,176
	1917	9	38,889	39,446.42	36,680
	1918	52	147,805	152,028.03	159,859
	1919	104	253,774	283,971.06	286,812
	1920	60	114,664	127,818.17	125,249
	1921	44	155,889	164,575.94	132,836
		273	726,067	785,465.72	762,212
Swedish.....	1915	17	50,824	58,174.76	53,292
	1916	13	41,537	35,892.70	47,236
	1917	18	69,202	56,793.78	94,515
	1918	26	80,191	74,621.25	132,521
	1919	27	95,684	88,572.73	143,516
	1920	19	76,825	62,268.74	74,244
	1921	25	113,661	93,331.25	128,919
		145	527,924	469,655.21	674,243
Spanish.....	1915				
	1916				
	1917	20	49,124	47,731.15	71,080
	1918	11	24,469	24,032.78	35,394
	1919	5	11,066	11,092.29	10,047
	1920	41	106,056	98,228.02	101,563
	1921	44	117,400	118,548.41	143,076
		121	308,115	299,632.65	361,160

TABLE No. 54.—Statement showing the number of vessels, the Panama Canal net tonnage tolls assessed, and tons of cargo carried by vessels of the principal nations passing through The Panama Canal during the first seven years of its operation—Continued.

Nationality.	Year.	Number of ships.	Panama Canal net tonnage.	Tolls.	Tons of cargo.
Italian.....	1915	2	4,158	\$3,992.40	900
	1916	1	3,861	2,779.92	.....
	1917	2	6,430	6,029.80	5,700
	1918	4	13,218	16,875.70	11,450
	1919	.....	.....	.....	.....
	1920	26	98,692	98,959.79	63,441
	1921	25	102,783	103,206.60	47,988
		60	229,142	231,844.21	129,479
Miscellaneous.....	1915	11	22,583	24,931.12	21,036
	1916	8	4,733	3,700.39	345
	1917	51	41,951	41,097.84	36,349
	1918	30	25,937	22,203.60	30,904
	1919	27	30,411	31,907.67	31,977
	1920	34	97,211	98,534.81	106,802
	1921	63	122,046	120,035.14	143,003
		224	344,872	342,415.57	370,416
Totals.....	1915	1,075	3,792,572	4,367,550.19	4,888,454
	1916	758	2,396,162	2,408,089.62	3,094,114
	1917	1,803	5,798,557	5,627,463.05	7,058,563
	1918	2,069	6,574,073	6,438,853.15	7,532,031
	1919	2,024	6,124,990	6,172,828.59	6,916,621
	1920	2,478	8,546,044	8,513,933.15	9,374,499
	1921	2,892	11,415,876	11,276,889.91	11,599,214
		13,099	44,648,274	44,805,607.66	50,463,496

Respectfully submitted.

JAY J. MORROW,
Governor, The Panama Canal,
Balboa Heights, Canal Zone.

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